The Builder.

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Wall Paintings at Mount Stuart, Rothesay: Life of St. Margaret, Queen of Scotland.—By Mr. H. W. Lonsdale ..... *Three Double-Page Ink-Photo's.*

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Architecture at the Royal Academy.

THE architectural collection at the Royal Academy seems to have rather a tendency to become small by degrees and beautifully less. The number of drawings in the Architectural Room this year is under two hundred, and the high-water mark on the walls seems to have lowered. Whether this is the result of an increasingly high standard assumed by the hanging committee, or of a benevolent feeling that it is no kindness to delude architectural contributors by hanging them at a height where drawings such as they send cannot possibly be seen to any good purpose, we know not. Perhaps both considerations operate more or less. We do not know that this shyness on the part of the hanging committee is much to be deplored. The majority of the drawings they have hung are worth hanging. About a few we are puzzled, but in general the standard of the exhibition is good, though there cannot be said to be any very striking works, and we must admit that it is little use to take the trouble of hanging an ordinary architectural drawing anywhere higher on a wall than the limit chosen in the present instance.

The general impression is that there is a larger proportion of decorative work than usual. This meaning in most cases drawings in which colour is the predominant source of effect, the decorative effect on the room is advantageous. The hanging generally is effective. We do not know whether the architectural hangers have taken a hint from Mr. Mortimer Menpes, but there seems to be something of the same idea which is to be seen, as we have already observed, in his exhibition, of stepping the frames up and down in oblique lines on the walls, although in this case there is a centre-point and a symmetrical stepping on each side, a proceeding abhorrent to the mind of the Japanese artist or Anglo-Japanese critic. However, the room looks pretty and attractive in general effect, and contains much that is of interest in detail, though in regard to purely architectural design the show is hardly so good as that of last year, and in this class of work there are no drawings which can be at once selected as forming the most important and central features of the collection.

This being the case, we may commence by mentioning certain large and rather unusual drawings of decorative work, which occupy a prominent position at the two ends of the room, and which go far to contribute to that decorative effect to which we have already alluded. Mr. J. A. Heaton has the good fortune, not unmerited, to occupy the centre position at both ends of the room. No. 1,766, at the east end, is described as "Acanthus, Oak, and Privet: a Piece of Wall Decoration." This is a large and bold piece of decorative design, in which the space is covered with a growth of acanthus and oak leaves intermixed, conventional in regard to detailed treatment, but irregular, and perhaps a little too naturalistic in general style. The privet element is introduced at the base of the design, the smaller detail of this portion giving effect by contrast to the broader and more massive style of the upper portion. We called it a panel, but the panel is merely formed by framing the design as if it were a portion arbitrarily cut out from a continuous design. The question occurs, in looking at it, whether it would be easy to continue this design over a whole wall-face without monotony, as it is a design in which artificial repetition of parts does not seem to be provided for. No. 1,868, at the west end of the room, is a piece of design somewhat similar in character, but which is complete as a panel in itself. Acanthus leaves, of a dull golden colour, form a kind of framework to the whole, the centre being filled in with broadly-treated foliage in lower tones, and intermixed with a few points of decided colour provided by poppies and other flowers. In the style and manner of both of these there is something novel and decidedly effective. Below this latter design is hung a portion of a frieze in *gesso duro* (1,867), by the same artist, in which the elements are "olive and vine." This is in slight relief, and with a dull metallic lustre which in itself is very effective. Olive and vine, however, are used on entirely different scales. The olive element is introduced in the shape of whole trees placed vertically at regular intervals, and with their roots showing at the base of the stem, and between these are festoons of vine leaves tied up by ribbons in large knots with flowing ends. The combination is not satisfactory, for the vine festoons appear to the eye to depend from the olive trees (though the design does not necessarily imply this), and the trees are far too light and small in scale to appear satisfactory in this relation. The design is a good suggestion of what may be done in this material, but is hardly satisfactory in itself. At the east end of the room again, and on either side of Mr. Heaton's wall decoration aforesaid, are two large coloured drawings by Mr. T. W. Camm (1,757, 1,767), consisting apparently of two sections of a stained-glass window illustrating the "Defence of Birmingham against Prince Rupert." Mr. Camm is an artist who has in other works shown a great desire to impart originality of subject and treatment into glass design, and we entirely sympathise with the endeavour to go out of the beaten line of Scriptural subjects and Mediæval saint-lore in stained windows. We presume, moreover, that these are designed for some situation in which the subject chosen would be specially appropriate. It is, however, a very difficult one to treat in stained glass. The actors in each scene are Puritan troops, and their uniform, with its dull buffs and browns, is not happily adapted for a class of art in which colour must be the element of predominant interest. The half-timbered houses of Old Birmingham, which form the background, are, again, rather ill-adapted for introduction in work which must be decorative or nothing; and in No. 1,767, which, in regard to the figures, is the best and most spirited of the two, the street is seen receding from the eye in oblique perspective, as if one were looking up it, a kind of treatment quite out of keeping with stained glass. We presume that, as executed, there would be a decorative border to each subject. This is not shown in the drawing, however, and the general impression is that it is too much of a picture and too little of a window. Let the author, however, have all credit for his originality of idea and treatment, though the drawings look more like designs for fresco than for stained glass. At the opposite end of the room is another large cartoon for glass, by Messrs. Shrigley & Hunt; that is to say, it is produced in their establishment. Who is the real author of the design does not appear, as it ought; for, as we have often observed, a "firm" cannot properly be said to design anything. The firm may carry out the design, but some individual must have drawn it, and in such a case we wish to know the name of the real artist. The Academy would do some good in regard to this point if they would make up their minds to decline hanging works unless the name of the actual and individual designer were given. The design is obviously inspired by the character of Mr. Burne Jones's window designs. It is a single figure of an angel, whose voluminous wings furnish a rich background to the figure, which stands also on a ground powdered with

flowers and conventional foliage. It is very difficult to judge from a cartoon what would be the colour-effect in the executed window. In the drawing, the prevailing tone is low and rather cold, the only decided colour being some blue in the draperies, the remainder being in various tones of blueish grey, and even the nimbus of the angel is of cold greyish tone. Transmitted light would warm up all this, and give probably quite a different effect; in the drawing the effect is rather too subdued and monotonous, but it is a refined and by no means commonplace work, and the whole space employed is well filled up.

Among the first of the purely architectural designs, in the order of hanging, are two of the competition designs for the Imperial Institute: by Messrs. T. N. Deane & Son (1,720), and Messrs. Aston Webb and Ingress Bell (1,728). These we had the pleasure of illustrating some time since, and also commented upon them at length at the time of the competition. That by Messrs. Deane is a fine Classical composition of the symmetrical order, with curved wings or quadrants on either side; and as the plan is not given, the design is left to make its own appeal as a piece of architectural effect, without any attention being drawn to the inconveniences of planning which were almost inseparable from the laying out of the design. Messrs. Webb & Bell's design, with its separate tower in the centre of the *place*, is also hung without a plan, which is to be regretted, as their plan was a good one, and the exhibition of it would have given increased value to the design.

Adjoining these are two large drawings showing a competition design for the Bombay Municipal Offices (1,721 and 1,727), by Mr. R. Chisholm. The author gives a "key-plan" (with no names of departments, however), showing that the buildings are arranged round the end of a triangular tongue of land between two roads,—Cruickshank-road and Hornby-road. There is a large square block with a bulbous dome over it, as the termination at one end of the range of buildings, the rest of which go round the site in rather lower dimensions and divided into pavilions. The general treatment is derived from Indian or Saracenic sources; bracket-capitals are employed in the columns in the two lowest ranges of verandahs. The domed block has three large pointed windows in its main story, which are filled in with tracery in a square pattern; in the angle pavilions of the other buildings the windows are filled with flowing tracery of a Saracenic character in a very elaborate manner. Below the principal string-courses are projecting tile-courses or eaves to keep the heat off the walls. The cornice is adorned with a cresting in that Oriental taste which was imitated in the Ca d'Oro Palace, but with intervening features taking the place of the pedestals and vases which recur in the Classic cornice. There is a great deal of work in the design, and the drawings, two large elevations, are most conscientiously made out; but though, as we have said, there is a general Oriental look about the design, the European hand is everywhere obvious, and thus there is a sense of incongruity and incompleteness; the building has an Oriental aspect without Oriental feeling. We doubt the architectural policy of treating Anglo-Indian buildings in this spirit; we are inclined to think that architecture representing the European race is better treated as European architecture, with a modified treatment to suit the climate, rather than this kind of half pretence of Indian design and workmanship.

We will take the rest of the drawings in order, omitting those on which we have no remarks to make. "Design for Stained Glass Window" (1,722), by Mr. J. J. Wrathall, is a fine little bit of colour, with rather peculiar treatment. The window is a single-light round-arched one, and a central compartment of the same shape is formed by a row of cherubs' heads, which form the frame to a figure of the Virgin in a blue mantle; the wings of the cherubs, rich crimson and low-toned green, form a kind of diaper filling up the space between the inner panel and the border; this is very good, but the device of stringing their heads together] like so many peas, to form a border of a panel, is not a very suitable way of treating the human (or cherubic) countenance. A small coloured interior, showing "Decoration of a Drawing-room" (1,723), by Mr. Henry B. Bare, shows a rather rich and harmonious combination of tones,—dull red flowered diapers on the walls, with a warm golden tone on the frieze and ceiling, the carpet showing a larger diaper pattern, in which decided reds predominate; upholstery of furniture, dark blue. Mr. Field's "The Dining-room, 30, Thurlow-road" (1,725), is a pen sketch of an interior treated in a very solid fashion, with heavy square pilasters flanking the window bay, with a cornice which is also repeated along the bookcase that fills up the left wall; this cornice cuts rather awkwardly into the wall just above the line of the frieze, looking as if it were an after-addition. The drawing is freely and effectively sketched, and the figures well put in. Mr. Jackson's "Thorne House, near Yeovil" (1726), is a beautifully-executed monochrome water-colour drawing,—quite a study for the execution of architectural drawing in this kind of medium; the house, however, only reproduces the features of a special date of English architecture, pilasters springing from corbels standing out from the wall, running up through two or three stories to end in a spike or "bottle-stopper" finial. It is a pity that an architect of Mr. Jackson's ability and artistic power should reproduce such very bad pieces of architectural detail as these finials, merely to complete the resemblance to a certain type of building of a former day; he might try his hand at improving this kind of detail, at all events. Mr. W. Young's "Banqueting Hall in Glasgow Municipal Buildings" (1,729) shows a large saloon with a segmental coffered ceiling divided into several compartments by large broad ribs or projections, which spring from a projecting pier provided with Corinthian-capped pilasters and a cornice; between these piers is a smaller order and a lower cornice, leaving a large frieze. As far as can be judged in the absence of colour, the general appearance of the room is what is called "sumptuous," but we do not know that more can be said for it.

Mr. Leonard Stokes's "Roman Catholic Church, Folkestone," exterior and interior (1,730–31) is an exhibit it is a pleasure to look at. It is an admirable piece of effective pen drawing, for one thing, and a most effective and solid modern Gothic design, with a great deal of originality. The exterior shows a deeply-recessed east window of "Perpendicular" type, but with richer treatment than the average Perpendicular window; a plain square tower at the angle is treated with a very effective lantern stage with richly-traceried windows under square heads. Only we do not see the beauty of the features at the termination of the buttresses, which look like little chimney-shafts. Internally, there is a design in two stories, a very large triforium and clearstory combined, with deeply-splayed windows; and below, a series of coupled piers connected by a small arch transversely. The roof is a pointed wooden wagon-vault with the ribs showing, and with a deep and heavy cornice. A vaulting shaft, however, runs up the piers, as in so many Mediæval buildings, and terminates in a flat Tudor-like flower ornament, spread out on the lower member of the cornice, looking a little as if the vaulting shaft had been split up into a flower form by being jammed against the cornice; it may not look so in execution, however. The treatment of the ground-story arcade, with a broad, plain soffit, and a great half-round moulding at the angle, enriched with flowers at intervals, is very bold and effective.

Mr. J. Coates Carter sends a large coloured elevation of a design for a new front of Milan Cathedral (1,735), one of those submitted in competition, we presume. He shows five doorways, a centre and two subordinate ones, with gables and deeply-recessed and enriched porches; the centre of the façade goes up as a gable flanked by two lofty pinnacles, and the extremes of the façade are occupied by towers, the straight cornice line between the towers and the centre being also broken by a tall pinnacle midway. The towers are roofed with timber spires with a gilt covering,—at least, that is the impression conveyed by the drawing; the spires are carried up to very nearly the height of the existing central feature of the cathedral. The design is suitable enough; the detail is assimilated to that of the existing work; but this rather thin and wiry type of detail requires, it seems to us, to be more broadly massed to produce anything like a rich effect. The general impression of the design is that of masses of wall-space with decorative treatment in parts. The only way to carry off the inherent defects of the type of Gothic detail characteristic of Milan appears to us to be to crowd as much into the space as possible, and to give it rather the effect of masses of detail with occasional intervals of plain wall than the reverse. That was the method adopted in the design of the Houses of Parliament, which (local differences apart) represents Gothic of a similar type to that of Milan; and that treatment saved the building from the degree of failure which must otherwise have been inseparable from the type of detail adopted. In Mr. Carter's design the bands of arcade and tracery ornament carried across in the midst of plain wall look weak and flimsy; the detail is not solid and powerful enough in type to be effective when so treated; it requires very rich treatment and a massing together of a crowd of detail to give the effect of richness and to conceal the real weakness of the detail. Apart from this, Mr. Carter's design shows a conscientious endeavour to produce a façade in keeping with the present cathedral.

We will proceed with further remarks on the architectural drawings in future numbers.

THE ROMAN WALL OF LONDON:

THE RECENT DISCOVERY AT ALDERSGATE.

WE are reminded from time to time that London was once a fortified city, surrounded by its wall of defence and its moat, either by some passing allusion derived from some old history or at more rare intervals by the discovery of some fragment or other of the ancient wall itself. The discovery awakens no little interest for a brief period, but the fragment is either rapidly demolished, wholly or in part, or covered over again. Beyond the Bastion in Cripplegate Churchyard, and a portion on Tower-hill, now greatly shorn of the length which existed prior to the formation of the Metropolitan Railway, there is hardly a fragment remaining above ground of what was once a formidable enclosure. These fragments are of Mediæval date, with, perhaps, here and there a portion of a Roman brick; but there is nothing at all above the modern level of the construction which forms the base of the wall.

The rapidly-increasing demands of the Postal service have been the occasion of the discovery of a very fine portion of London wall. To meet the necessities of the department in question, the clearance of a large area of land for the erection of a third block of buildings has been effected, the French Protestant Church, the old Queen's Hotel, or the Bull and Mouth, and a great many houses having been demolished for the purpose. These works of clearance have already been noted in our pages, and some few of the many old associations of the site have been laid before our readers.

The northern boundary comes along what is the southern side of the churchyard of St. Botolph's, Aldersgate, which of late years has been formed into a pretty recreation-ground, now adorned with a small fountain and many flowers, the long disused burial-ground of Christ Church parish, to the west, being now thrown into the area. Those who have brought this transformation about may be congratulated upon the success of their work. At our visit on Thursday last, it was a pleasant sight to see this once uncanny spot so converted, and hyacinths and other flowers blooming in the heart of London, showing, indeed, that vegetation will flourish among us if a little ground only can be spared

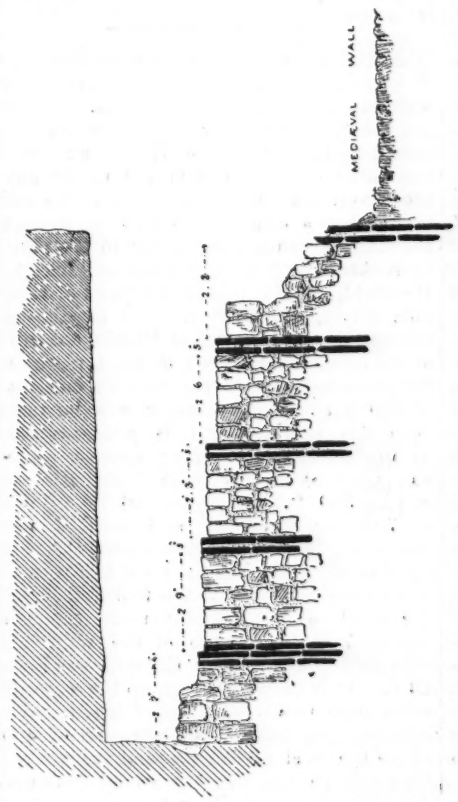
for the purpose. The boundary wall has long been noticed by antiquaries to be formed for the most part of ancient rubble masonry, and known to be the upper portion, at least, of the old City wall, the graveyard having been formed on the site of the old City ditch. The masonry is of no great interest, for it is clearly of late work, and very considerably patched with bricks. It can hardly be more than the parapet of the old wall, since it is only about 2 ft. in thickness, terminating in a coping of modern brick on edge, 9 ft. or 10 ft. above the present level of the churchyard.

Trial holes for the intended new building on the other side have revealed a very different state of things, which we will now describe.

By permission of the Office of Works, the Society of Antiquaries issued invitations to its members and to some few others interested in London antiquities to inspect the results of the excavations made. The meeting was called together at very brief notice, and the Society's officials and the active secretary, Mr. St. John Hope, may, indeed be congratulated upon the response that was rendered to their invitation. We found what was, under the circumstances, a large gathering of well-known antiquaries, and some ladies. There was not a little for a devoted antiquary to rejoice over.

A deep trench has been sunk down to the extreme base of the ancient wall, and it is carried along its whole extent for fully 100 ft. or more. The wall is in fine condition, except where its face has been cut into or removed for cellarage or other varying requirements of the old houses now demolished. Enough remains to enable us readily to consider what was its appearance from end to end. It rests upon a bed of hard clay. There is then a footing of three courses of fairly large walling-stones. A plinth, formed of three courses of large, flat, bright-red tiles, is laid upon this footing, one of them being a set-off to the first instalment of the wall itself. This latter consists of five courses of stone, capped by a double course of tiles. There is then another set-off of 2 in., and the wall is carried up another five courses of stone, terminating in a band of two tiles, as before. This construction is four times repeated from base to summit, there being thus four courses each of two layers of tiles, and a bottom course of three layers. In each case the walling-stones between the bands of tiles are arranged in five courses, although the heights measured from one band of tiles to the other vary slightly. The sets-off, too, vary from $1\frac{1}{2}$ in. at the base to fully 5 in. at the summit, at the point where our measurements were taken, and the work itself is a little different in other places. The masonry is of good hard stone, resembling Kentish Rag, hammer dressed, very evenly brought to uniform height to range in the courses, but of varying length. None of the stones exceed to any great degree a modern foot in length, and many are much smaller. The core of the wall is formed of similar stone, but less dressed, laid fairly regularly in courses, the whole being solidly bedded in hard gravel mortar, in which there is no admixture of pounded brick. The tiles vary in thickness and size, some being 1 ft. 5 in. long, others 1 ft. 1 in. long; the thickness is $1\frac{3}{8}$ in. and $1\frac{3}{4}$ in. They are well baked and fairly level. The four lower courses of tiles can be traced with hardly a break in their continuity from end to end, but the upper part of the wall has suffered so greatly by demolition and rebuilding that they can only be observed here and there among the Mediæval masonry which has been superimposed.

The lower part is in extremely good condition, the facework being in many places as perfect as when built, and the contrast of the bright bands of red with the masonry renders the wall well worthy of observation. So the visitors evidently thought, for the work was eagerly scanned, many descending to the bottom of the excavations. After it had been well examined, Mr. St. John Hope called upon Mr. Loftus Brock, F.S.A., to address the meeting. After having referred to the opinion of Dr. Woodard, who was the first to examine the structure of the wall early in the last century, and to claim for it a Roman origin, he proceeded to say how this opinion had been endorsed by subsequent writers as opportunity had occurred by the discovery of portions at various subsequent times. He then discussed the positions of these former portions, and indicated that in the Tower of London, Tower-hill, the Minories, Aldgate, Camomile-street, &c., wherever, in fact, the base of the upper Mediæval wall had been uncovered, it was found to have uniformity of design and workmanship. We had, thus, more evidence on which to form our judgment than had the former observers. In all the portions previously examined the wall resembled what was then before them, so that they could almost predict that if ever the outer side were uncovered, it would be found to have the same chamfered plinth of dark-coloured ironstone, such as had been found elsewhere. He then proceeded to speak of the position of the wall and of the supposition held by many that the original western wall of London had been a straight line southwards to the Thames from the existing bastion in Cripplegate Churchyard. At Aldersgate, as was well known, an extension at right angles to the westward had existed, while at Ludgate a second and smaller extension was made in the fourteenth century. This Aldersgate extension seemed very much as if



Section of Roman Wall Found at Aldersgate.

it had been an addition to the previous line of wall, and the thought had been a reasonable one that it had been effected in times later than the Romans. Here they were, however, in face of direct evidence, the evidence of the wall itself, the wall of such extension, that it was Roman work, agreeing with every other portion that had been examined, and showing that it was part of the work of the same people. He then called attention to the fact that the wall, from its position, is in a convenient place for its preservation, and he expressed the hope that the officials might be induced to forego the intended demolition.

We understand that at an early meeting of the Society of Antiquaries some resolutions bearing upon the subject will be passed. It seems, indeed, a great pity that such an interesting relic of Old London should be allowed to pass away. Some of the Post-office officials and others from the Office of Works met the party and explained the nature of the intended works. The requirements of the new building necessitate the excavation of the entire site down to a level of about 8 ft. below the base of the wall, but it is contemplated by them to save some small sections of it between the piers of the windows of the lofty building which is to rise on its site. The officials deserve thanks for their arrangements for the comfort of the spectators on the rough building ground. Boards were laid to form a gangway on the earth above the trench, and the wall was seen to great advantage. Standing as we did at the edge of the excavation, the appearance of the brilliantly-coloured wall, once entirely above ground, but now buried beneath the accumulated earth of many centuries, afforded ample subject for reflection.

We subjoin a section of the portion of the wall uncovered, with the principal heights figured. Near to the western end there is a small arched loop going through the wall, used in a later age for a drain. The thickness of the wall has not been ascertained.

NOTES.

THE Annual Report of the Institute of Architects has been issued to members. It includes, of course, the usual balance-sheet, and a considerable amount of detailed information as to various departments, and especially in regard to the library. The usefulness of the library, or the extent to which its usefulness is appreciated, is evidently on the increase; but the library is also on the increase, and imperatively demands more space, and we do not quite see where the space is to be got. There had been some intention of instituting an open book-case for books of common reference, on the same principle as in the British Museum reading-room, but this, it appears, is indefinitely postponed for want of space. This is to be regretted, for the alteration would save a great deal of time and trouble both to readers and librarian. In referring to the more general literary character now given to the "Journal of Proceedings," the Report is justified in recording this as a satisfactory innovation which has had good results, and increased very much the value and interest of the Journal. At the conclusion, reference is made to the amount of work recently thrown upon the Council "by the ill-considered scheme of Registration introduced by Col. Duncan into the House of Commons"; a tax on their time, of which the Council may justly complain, considering the obvious motives which prompted it. The Report thanks the principal societies which co-operated with the Institute and petitioned against the Bill, and concludes:—

"Of those local societies which petitioned in favour of it, nothing need now be said; but the Council would fail in their duty were they to pass over in silence the method by which signatures were obtained from the medical profession and the general public, and even from members of the Institute, to petitions in favour of the Bill. That any one should, by implication, induce the unwary to believe that 'in the majority of cases of enteric fever, the illness or death could have been prevented,—it being caused by bad water, faulty drainage,' or imperfect construction,'—if professional architects had been qualified by examination and registration, is bad enough; but that such an implication should have been publicly disseminated with the consent and complicity of members of the Institute, merits severe reprobation. The Chairman of the 'Architects', Engineers', and Surveyors' Registration Act Committee,' who is a Fellow of the Institute, and those Associates who are members of that Committee, knew very well that, in this country, the vast majority of dwelling-houses in which those preventible evils exist are not erected under the superintendence of professional men, even if they did not reflect that the 'jerry builder' would and could continue his recognised trade after the passing of the Bill they were helping to promote, with the same impunity as before; and it is no palliation of the kind of work recently done by them to be aware, as the Council are, that such misrepresentation of fact has been successfully refuted, and the whole situation explained, to the advantage of the Institute and the profession it represents."

THE Peers who take an interest in the recommendations of the Royal Commission on Irish Public Works are impatient of delay. The Commissioners are Sir James Allport, Kt.; Mr. James Abernethy, civil engineer; Mr. John Wolfe Barry, civil engineer; and Mr. Joseph Todhunter Pim. We called attention to their second Report on the 17th March last, which deals with Fishery Harbours and Railways, the first Report having dealt with

Arterial Drainage and Navigation. Lord Monteagle of Brandon said in Parliament on Monday last that a large number of copies of these reports had been sold in Ireland, showing the great public interest taken in the subject. In their first Report the Commissioners had made recommendations which would relieve the different localities from the expense and responsibity of the initial survey required, and the preliminary engineering, for the conclusions at which they had arrived were based upon the principle that the time had arrived when the Government was bound to take the initiative, and not only to assist the movement by means of money, but also by counsel and advice. He understood that there was a Bill already in course of preparation for introduction into the House of Commons, relating to Arterial Drainage. With regard to the development of the deep-sea fisheries, harbours constructed for that purpose could not be expected to become remunerative in certain localities at least, until after the lapse of many years, and he therefore thought there was a strong case for assistance to harbour works by means of State grants. Lord Emly mentioned that twenty-three years ago he had brought the subject of Irish railways before the House, and was supported by the late Chief-Justice Whiteside. If any pecuniary boon was to be conferred on Ireland, in no way could it be conferred so comprehensively and effectively as by some measure taken with the view to secure to Ireland the benefits of cheap railway transit. The system, indeed, in Ireland, followed the English model, but proved by disastrous experience to be utterly unsuited to Ireland. The agitators for reform in Ireland would soon be won over to the constitutional cause if they saw the Imperial Government set earnestly to work to remove every real grievance, and to adapt Irish institutions to the character of the people, and to the requirements of the country. The Earl of Leitrim said the small fishery piers which had been constructed had been of great use, and he considered it to be absolutely necessary that they should be established to a sufficient extent for the use of the fishing population, and of a character to suit the boats in general use. Large piers also might be serviceable if brought into immediate connexion with railways. The Earl of Northbrook complained of the delay in issuing the evidence upon which the second Report of the Commission had been founded, and until that could be examined he considered a discussion of the whole subject unadvisable. Earl Cadogan said the Chief Secretary for Ireland proposed to lay two Bills on the subject of Arterial Drainage upon the table of the House of Commons before the Whitsuntide recess, dealing with the rivers Barrow and Bann.

THE Glasgow International Exhibition will be formally opened by the Prince of Wales on Tuesday next, the 8th inst. An inspection early this week showed operations in a satisfactory state of forwardness, and it is now certain that the opening day will find the arrangements practically complete. The main building occupies 474,500 square feet of Kelvingrove Park, situated in the western quarter of the city, and it is the largest erection of the kind ever attempted in the provinces. In addition to the space thus covered, about 50 acres of the park have been set apart for exhibition grounds, and over these, besides Kelvingrove Museum of Industry and Art (a permanent institution) and the Bishop's Castle, in model, are scattered about a score of supplementary erections, including refreshment-rooms, kiosks, two large fountains, and a switchback railway. The river Kelvin, which passes through these grounds, has been cleansed and deepened, and a variety of curious vessels, including two gondolas from Venice, will be found in sportive use on its surface. West of Scotland exhibitors are the most numerous, as might have been expected, and the strongest sections are naturally those devoted to machinery and to shipcraft illustration; but all crafts, and most civilised countries in the world, are more or less represented. For the royal procession to and from the building, on Tuesday, the 8th inst., preparations throughout the city have for some weeks been in progress on an extensive scale.

THE portion of the City wall which a party of architects and archæologists visited on the 26th ult., and which is fully described in another column, is the same which was the subject of a Note in the *Builder* of October 1 last. It is clearly part of the curtain that extended from Alders Gate to the north-western angle of the wall beyond Grey Friars, by Smithfield, and the course of which is plainly delineated in our two first maps of London as drawn on plan, those by Braun and Hohenburgh and Radulph Agas. The superstructure which, no longer entire, yet stands as the southern boundary of St. Botolph Without and Christ Church graveyards, was laid over the City wall, which now lies exposed to view a few feet distant from the Government Money-order Office. A little enclosed garden behind that office,—and a relic, we take it, of St. Leonard, Foster-lane, burial-ground,—is being levelled up and laid out afresh, with a view, we are told, of incorporating it with the adjoining churchyard of St. Botolph. This public recreation-ground is temporarily closed during the present alterations at St. Martin's-le-Grand.

THERE are exceedingly few districts in the vicinity of London still unsupplied with water under Parliamentary powers. The areas not belonging to water companies are mostly served by Local Boards of Health, and the few remaining districts not falling under any of these powers are fast disappearing. We understand that a company is now in process of formation for supplying water to the parishes of Rickmansworth, West Drayton, Ickenham, Harefield, and Harlington, and parts of Hillingdon, Hayes, and Cowley. The population of this district is estimated at 19,000, but in view of the rapid development of most places near the metropolis the works will be laid out for 25,000 persons. The water will be derived from the chalk, which is noted especially in the locality, for strong springs. A well has been sunk, 1½ mile from Rickmansworth, 300 ft. in depth, 26 ft. of which is 7 ft. in diameter, and bricked round. According to the engineer's report, this well is capable of producing at least half a million gallons per day, and it rises to 3 ft. 2 in. above the level of the adjacent river Colne, and within 7 ft. of the top of the well. After pumping, the water in the well was lowered 13 ft. It is proposed to pump the water from this source to a service reservoir situated on a neighbouring hill at an elevation of 400 ft. above the level of the sea, and the whole district will be supplied thence by gravitation. As is usual with chalk water, no filtration is required, the fluid being bright and clear, but necessarily hard. About forty miles of piping will be laid, and a constant supply will be available. The total cost under the contracts is 61,745*l.*, including the purchase of the interests of the promoters' Acts of Parliament, the cost of the well and land, &c. The engineer is Mr. J. W. Grover, M.Inst.C.E., and the contractors Messrs. John Aird & Sons. Considering how well the chalk water companies already in existence in the neighbourhood are paying, the undertaking ought certainly to be successful.

THE Irish Roads Improvement Association, although only a few weeks formed, numbers over 100 members, consisting of the leading merchants, doctors, and other influential ratepayers of the city and county of Dublin. Its principal objects are: to call the attention of the proper authorities to the very bad condition of the public roads in many districts, and to impress on them the necessity for the surveyors paying closer attention to their work, and insisting on the contractors carrying out their contracts in a proper manner.

THE exhibition of Meissonier's remarkable painting, "1807," at Messrs. Tooth & Son's Gallery, is an event of note in the artistic world. The painting has been the work of three years of this great painter's life; it is to be his representative work of the Paris Exhibition next year; and it is worthy to be so. The work is a surprise in one sense, for instead of one of the small and minutely-finished oil-paintings by which the artist's name has become famous, we see a very large and rather broadly-handled water-colour, probably one of the largest works in water-colour that has ever been executed. It is one proof of Meissonier's power that he can be equally successful on a large scale and in a different manner of execution from that in which he has usually indulged. This must certainly be one of the most real battle pictures that was ever painted; there is no stage effect, no scene-painting, about it. The main incident is the charge of the 12th Cuirassiers, who fill the right-hand foreground, and are galloping past the emperor and his staff on their way to the point of action. No description can give an adequate idea of the vigour and reality with which this tumultuous group of riders are given. They are all in a kind of fury of loyal excitement in passing the emperor, and are shouting so that all their faces are strained and contorted with the exertion. The air is full of a confusion of waving sabres; some of the men lean forward pointing their weapons towards the emperor to emphasise their homage. The rider at the head of the troop, who has got rather past the staff position, turns in his saddle to shout at the emperor still, his left leg stretched straight on the stirrup to support him. The drawing of this figure is masterly. Every figure and horse, however, is a study. The emperor, on his white horse, lifts his hat over his head to the men, but with calm magisterial manner, in curious contrast to their frantic ebullition. A group of orderlies on the left, who are quietly waiting and reining-in their horses, contrast effectively with the hurly-burly on the other side of the picture. The corn over which the men ride, and the path worn over the field by peaceful feet, are incidents which give additional reality and point to the representation. The picture is a wonderful realisation of a moment of the life of the past, such as could only be produced by the combination of keen historical insight with the highest executive power.

THE *Art Journal* for May contains an interesting article on "Ancient Cairo Houses" by Mr. Henry Wallis: an article inspired partly by the desire to draw attention to the artistic and picturesque character of the old Cairo architecture, and to lament the inroads of European taste; which have left the Cairo of John Lewis, he tells us, a thing of the past. This is lamentable, but we fear protests are unavailing. The Western influence is predominant in the world at present, and is changing the face of everything Oriental, and asserting itself everywhere. According to Matthew Arnold's sonnet ("East and West"), the Eastern and Western civilisation and artistic feeling represent two antagonistic principles which cannot live together. They take their reign alternately:—

> "In conquering sunshine bright
> The man of the bold West now comes arrayed;
> He of the mystic East is touched with night."

The latter will have his turn again, doubtless; but hardly in our days. So we must be content to mourn over the transfiguration of gorgeous Eastern thoroughfares into Cromwell roads and Northumberland avenues. We cannot help it; for it is a free age, and the majority will have it so.

MARBLE HILL, Twickenham, is advertised to be sold by auction on the 6th of June. The house is said to have been designed by Lords Burlington and Pembroke for Henrietta Howard, afterwards Countess of Suffolk, George II. contributing 10,000*l.* or 12,000*l.* towards the cost of it; and is interesting as a characteristic specimen of the stately "villa" of the first half of last century, when that term had not sunk to its present degradation. Prominence was given to the first floor, both the ground and second floors being kept low. Mahogany was very largely used in the interior, not only the staircase but even the

floors of some of the rooms being formed of it. According to Cobbett's "Memorials of Twickenham," the gardens were laid out by Pope, and the cellar stocked by Dean Swift, whose prognostication, in the amusing "Dialogue between Richmond Lodge and Marble Hill," written just after the news of the death of George I., seems likely soon to be fulfilled :—

"Said Marb. H.—
Some South Sea broker from the City
Will purchase me (the more's the pity);
Lay all my fine plantations waste,
To fit them to his vulgar taste."

Except that probably instead of the South Sea broker the demon builder is more likely to be the purchaser, for the grounds extend over 66½ acres, and have a river frontage of 700 yards.

WE shall, as usual, devote some space next week to the paintings and sculpture at the Royal Academy; meanwhile, we may say, *en passant*, that as far as we could fairly gather from a hasty turn through the rooms, the exhibition is a good average one, but not equal to last year's. Perhaps the finest and most complete thing in the whole exhibition is Mr. H. Moore's "Nearing the Needles." Among prominent works of the year are a large painting by Sir F. Leighton, of "Andromache" in captivity; a large one, much larger than usual, by Mr. Tadema, "The Roses of Heliogabalus"; an exquisite landscape by Sir John Millais; some portraits by Mr. Holl of unusual vigour and character; a very large painting by Mr. Vicat Cole of "The Pool of London"; a beautiful nude study, "Danaids," by Mr. G. W. Joy; a fine ideal work, "Dawn," by Mr. Watts; and a domestic scene by Mr. Orchardson, of somewhat less unhappy meaning than his recent works, perhaps also less interesting. The exhibition is remarkable, among other things, for the number of large portraits of ladies in more or less decorative and effective costumes.

THE best thing at the Grosvenor Gallery unquestionably is Mr. Gregory's portrait (No. 9) of a young girl, seated on a table, in a crimson dress and amid elaborately-painted accessories of furniture, a Chinese jar (which rivals Wilkie's in the "Letter of Introduction"), &c., the face, very firmly painted, relieved against a background of gilt wall-diaper in relief. This wall, by the way, the painter, in his desire to give force and brilliancy to it, has brought too near the foreground, as will be at once seen on carrying the eye up from the floor to the upper part of the wall. The position of the girl, with one foot drawn up, is awkward; but the whole picture is wonderfully brilliant and powerful, and there is nothing else in the gallery to stand alongside of it. Generally, there is a marked declension in the Grosvenor as an exhibtion. Mr. John R. Reid's "Smugglers" (59), despite some remarkable types of character among the figures, is what can only be called loud and violent in colour and style; and Mr. Hacker's large painting, "By the Waters of Babylon" (93), though very well executed, does not keep up the promise of his former works as regards interest and originality. Mr. Stuart Wortley has two admirable portraits (130, 144); Mr. Briton Riviere's "Adonis's Farewell" (113), where the classic huntsman goes off among his hounds, has much spirit and movement; of course, it is really a painting of dogs. Mr. Skipworth's "Miss Groome" (7), is a pleasing portrait, and Mr. Shannon's "Myrrah" (179), a large painting of a fine-looking woman seated on a tiger-skin, is successful in its aim. Mr. Jacomb Hood has a large picture entitled "The Triumph of Spring" (170), a "classical" triumph of men and women and children of we know not what period or country; it is a pretty kind of fancy, but hardly possesses a value proportionate to the size of the canvas. Among landscapes are Mr. Severn's "Clearing after a Storm, Coast of Devon" (26), a powerful but rather hard painting; Mr. Henry Moore's "Frost in the Air" (39), a fine sea-piece with the red glow in the sky indicative of frost; Mr. McWhirter's "Venice" (66), a beautiful little work; Mr. P. R. Morris's "A Storm on Albion's Coast" (74), with an effect of sky in it; Mr. Parton's "St. Martin's Summer" (106), rather mannered; and two landscapes by Mr. Keeley Halswelle, still more so,—scenic effects of a flashy character. Mr. David Murray's "Uplands of Picardy" (166), and Mr. Reid's "Fisherman's Haven" (137), should be looked at; the latter seems painted in an assumed style, rather recalling such English coast-painters as Collins.

IT is to be hoped that Mr. Plunket will succeed in putting some check on the abnormal height to which it is proposed to carry the new building designed by Messrs. Archer & Green at Albert-gate, though it is to be regretted that matters have been managed or mismanaged so that the Commissioner of Works is reduced to the threat of carrying up the park fence to obstruct the light of the new building, to compel the owners to come to terms. Some steps must be taken, however, to limit the height of buildings in London, unless the the thoroughfares can be simultaneously widened, which is practically impossible in most cases. For sanitary as well as for architectural reasons a certain proportion of height of building to width of street should not be exceeded in cities; and we ought not to allow towers of Babel to be built to shut out all the light and air, merely that building owners may get an increased return in rent for the purchase-money of the site.

LETTER FROM PARIS.

AMONG various small exhibitions which, in April, form precursors of the *Salon*, the Pastellistes have been in occupation of the Georges Petit Gallery. Pastel work, so much in favour in the last century, has again obtained a recognised place in the present day; and the Pastellistes, thanks to the zeal of M. Roger Ballu, the son of the eminent architect, are now organised into an association. Their exhibition has the merit of being a small one. The exhibitors this year are only thirty, who send 137 drawings,—among these M. Puvis de Chavannes is pre-eminent. We may mention also the portraits of M. Gervex and M. Besnard, and the flowers and sea-pieces of M. Duez, the equestrian pictures of M. J. L. Brown, where the red coats glare and glitter amid the green of the landscape, and the rural scenes of M. Lhermitte. In the same galleries there is a collection of studies and sketches in Canada by M. Gaston Roullet.

At the École des Beaux-Arts an exhibition of French caricatures has been opened; an exhibition got up by M. Dayot, Inspecteur des Beaux-Arts, and the proceeds of which go to the society for the relief of the families of shipwrecked sailors. This exhibition includes works by all the celebrated caricaturists since the beginning of the century. Carle Vernet, Boilly, Pigalle, Daumier, Henri Monnier, Granville, Cham, Charlet, Raffet, Gavarni, and even Victor Hugo, who occasionally stooped to caricature. The exhibition comprises about 650 drawings.

We may mention also an exhibition of charming landscapes by M. Edmund Yon, and one of the so-called works of M. Van Beers, an artist by no means destitute of talent, but who has been convicted lately of the faulty expedient of keeping a "fabrique" of paintings executed under his directions, and to which he signs his name; a very aristocratic fashion of painting.

In view of the continued demand for more space at the Luxembourg, it is said that the Ministry of Fine Arts has an idea of forming a new gallery as an annexe to the ancient orangerie, to the further destruction of the pretty garden of the Luxembourg, already so much shorn, and which seems likely in the end to disappear altogether under the encroaching buildings. Would it not be better to build a museum of works of living artists on the site now destined for the monument of the Republique, which will cost a great deal, and be little gain to any one?

In regard to the lamentable state of the buildings of Versailles, which we alluded to in our last, we are glad to be able to record that the Government has at last voted a considerable sum, 440,000 francs, for the most urgent repairs; but this will not go very far to prevent the palace of Louis XIV. from falling into ruin.

The works for the Exhibition go on at present to appearance slowly, as a great deal of the work just now consists in preparations for raising the iron constructions into position. The Eiffel tower is getting on in its second story, which will be completed in a few months. In the gardens at the base of the tower the late spring is now bringing out the foliage and enabling us to see the effect of the park created by M. Alphand at this point. On the Invalides esplanade the exhibition-gallery for the French colonies is in preparation, which will have a façade of 250 mètres in length. This portion of the works is under the direction of M. Sauvestre as architect, with whom is M. Tournelle as engineer. M. Villedieu is architect for the Cochin China Palace in the same neighbourhood, and for the Tonkin pagoda and the Annamite village. The work on the Champ de Mars generally is going on well, but unfortunately the dark clouds on the political horizon and the uneasiness caused by the dissensions in the Government are not favourable to that spirit of confidence which is so much needed for the success of this national enterprise. It is said that the Gobelins manufactory is to be brilliantly represented; and the last touches are being put to thirteen splendid tapestries, among them the "Lettres, les Sciences, et les Arts," after the cartoons of M. Ehrmann and intended for the National Library.

The restoration of the Bastille and its surroundings, of which we have spoken, is now complete, and this exhibition, due to private enterprise, will be opened to the public in the course of the month. It is really a curious spectacle, and well worth a visit. The architect, M. Collibert, has kept closely to the authentic documents and plans of the period. We have noticed before some restorations of old houses and shops adorned with curious signs. We are disposed to criticise, however, the sculptures of the Church of the Visitation (now a Protestant "temple"), which are out of scale with the façade. M. Collibert has made rather a mistake, too, in not having sufficiently respected the ancient architecture of the Porte St. Antoine. It would have been much better to have reproduced it faithfully, instead of adapting the two lions sculptured by Jean Goujon for the Hôtel Carnavalet: this is a want of taste and an anachronism, though of course the general public are not conscious of it. As to the restored Bastille itself, which raises its towers bristling with cannon at the end of the old street, it has been constructed of solid materials which promise it a much longer life than the exhibition of which it is an appendage.

At the École des Beaux-Arts the students have been in all the fervour of competition. The names of the architectural competitors for the Prix de Rome we have already given. The ten painters who will now enter for the Prix de Rome are as follow:—M. Verdier, pupil of MM. Jules Lefebvre, Maillart, and Boulanger; MM. Lenoir and Charpentier, pupils of MM. Bouguereau and Tony Robert-Fleury; M. Royé, pupil of M. Benjamin Constant; M. Thys, pupil of MM. Boulanger, Hebert, and Merson; M. Lavalley, pupil of MM. Cabanel and Th. Maillot; M. Marioton, pupil of MM. Bouguereau and T. Robert-Fleury; M. Buffet, pupil of MM. Boulanger and Lefebvre; M. Elliot, pupil of M. Cabanel; and M. Véber, pupil of MM. Cabanel and Maillot. The decision will be given on the 27th of July. In sculpture twenty pupils are to compete:—MM. Pignol, Fournier, Seisse, Roux, Dercheux, Rhister, Roussel, Barcet, Tonetti, Charles Pillet, Ledru, Guillaume, Baralis, Champeil, Jacques, Dubois, Ternois, Schegg, Chauvet, and Desruelles. The "Prix Lemaire," recently founded in the section of sculpture, has been awarded to M. Albert Loze, pupil of MM. Dumont and Bonnassieux; a second medal going to M. Gasq, pupil of MM. Jouffroy and Falguière; and a third medal to M. Thounissen, pupil of M. Cavelier.

We may mention also the competition founded by Duc in favour of high-class architectural studies. The Académie des Beaux-Arts has awarded this prize to M. Albert Ballu for his "Palais de Justice de Bucharest," of which we made mention in our account of the *Salon* of 1886. Honourable mention was accorded to M. Dauphin for his École Supérieure d'Algiers, and a "second mention" to M. C. Bernard for his design for a monument to Victor Hugo.

At the Hôtel de Ville, the decoration of the two grand staircases has been entrusted (subject to the approval of the Municipal Council) to M.

Olivier Merson, an artist who very well understands the application of decoration to architecture. Two other painters will be selected to co-operate with him in the decoration of the cupolas of these two staircases. The Committee has selected MM. Félix Barrias and Gustave Boulanger for the ornamentation of the two arcaded porticos around the grand Salle des Fêtes, and M. Tattegrain will have the decoration of the room opposite that given to M. Lhermitte. Two "dessus de portes" have been reserved for M. Urbain Bourgeois, in the Salon des Lettres. Sixteen landscape artists have now to be chosen for the decoration of the two side galleries of the "escaliers des fêtes." The remainder of the decoration, as we have said, will be thrown open to public competition.

A competition has also been set on foot for the painted decoration of two of the suburban Mairies, that of Arcueil-Cachan, of which we gave an illustration not long since, and that of Nogent-sur-Marne. Forty-nine competitors have responded to the invitation. Among the sketches sent in the most noteworthy are those of MM. Michel Lanzon, Urbain Bourgeois, Henri Martin, Bourgonnier, Paul Baudouin, and Delance. As, in most of these competitions, the question of artistic merit is little considered in the selection, it is not surprising to find that not one of these artists has been placed except M. Baudouin; and for the Mairie of Arcueil MM. Bramtot and Vimont have been selected to compete with him for the final decision. For Nogent, the three sketches reserved are those of MM. Debon, Leenhardt, and Ary Renan, the latter a young disciple of M. Puvis de Chavannes, who exaggerates the faults of his master without recalling any of his merits.

The Société Centrale des Architectes has already drawn up the programme of work for the next Congress, which will commence on the 11th of June. The first meeting will be devoted to the constitution of the Bureau and to preparatory work. On the 12th of June there will be a visit to the Russian Church in the Rue Daru, and a paper on the Architecture of Cambodia, with a visit to the Ethnographic Museum and to different sections of the Trocadéro Palace. On the 13th, a visit to the works of the Gare St. Lazare and the Gare des Merchandises, and an inspection of the hydraulic elevators for loading the trucks. The same day there will be two lectures at the Louvre, one by M. Dieulafoye on "L'Apadama de Suse," the other by MM. Heuzey and Pottier on "La Céramique dans l'Antiquité." On the 14th, there will be an excursion to Orleans, which is so rich in archæological monuments and curiosities. On the 15th, after a morning dedicated to the consideration of the "Caisse de Défense mutuelle," there will be held, in the afternoon, the usual distribution of honours and awards. In connexion with this meeting, MM. Raulin and Paul Wallon will be asked to prepare biographical notices of the life and works of M. Questel and M. Hénard. On Saturday, the 16th of June, the Congress will wind up with a visit to the workshop of the International Exhibition.

Madame Rouvier, wife of the French politician of that name, who has made a reputation in sculpture under the pseudonyme of Claude Vignon, has died at Cannes. A pupil of Pradier, she had produced some noteworthy works, especially the "Enfance de Bacchus," a "Pêcheur" which is in the Luxembourg Museum, two groups of children erected in the Square Montholon, and a certain number of portrait busts of eminent politicians. She latterly occupied herself also in art-criticism.

The death of another sculptor of talent is announced, M. Henry Dumaige, who was recently working at the Caryatides of the Salle des Fêtes of the Hôtel de Ville. He was a pupil of Feuchère & Dumont, and his statue of Rabelais, after having obtained the prize in a competition, as well as a medal in the *Salon* of 1880, was inaugurated the same year at Tours. Among his most remarkable works may be cited the "Age d'Or," "Le Retour des Champs," "Patrie," "Hero," "Mercury," "Molière," &c.

We have to record also the death of Bertinot the engraver, at the age of sixty-six. He was a pupil of Drolling and of Martinet, whom he succeeded at the Académie des Beaux-Arts in 1878. He obtained the Prix de Rome in 1870, and medals of various *Salons*, and was a Member of the Institut, and gained the cross of the Legion of Honour. His principal works are the reproduction of the "Vierge au Donataire" of Vandyck, of the paintings of Baudry at the Opera House, the portrait of Cherubim by Ingres, that of Vandyck by himself, that of Alexander VII. by Velasquez, &c. He was an artist of rare merit, who leaves a considerable gap in the constantly decreasing band of engravers on copper.

At the moment of closing this letter we hear the news of the sudden death of M. A. Durand Claye, an able co-operator of M. Alphand, and one of the most eminent engineers of the Ponts et Chaussées. He was charged with the important service of the sanitary work of Paris, and is the fourth engineer-in-chief whom the municipal administration have lost during the last three years. He was only forty-seven. He had devoted all his professional career, it may almost be said, to the improvement of the sanitary condition of the Seine. It is to him that we owe the utilisation of sewage in agriculture in the peninsula of Gennevilliers. He was, it may be said, universally known and esteemed in the scientific world, and his premature death is a great loss to the city of Paris as well as to the Corps des Ponts et Chaussées.

THE GREEK THEATRE.

ON the 20th of April Sir C. T. Newton commenced a course of six lectures at University College upon the Greek theatre. In comparing ancient and modern ideas on this subject, he said we must lay aside most of our associations derived from the modern stage, and note how some of the difficulties of the modern manager were dealt with under the different conditions of ancient society. Female parts, for instance, were performed by masked men or boys, and the costume, both in tragedy and comedy, was intentionally varied from that of real life; the language had to be adapted to its transmission over the immense open space of the auditorium; the performance took place by daylight, and only at certain seasons or festivals. The motive was a religious one, the honour of Dionysos. The great Athenian festivals were the rural Dionysia, at the end of autumn, the Lenaea in December, the Anthesteria in February, and, greatest of all, the Dionysia in the city in March, all of them connected with the grape cultivation; and it was at the Lenaea and Greater Dionysia that the regular drama originated. The first germ was probably a choral song in honour of Dionysos, that of tragedy, the Dithyramb, having for its theme the sorrows of the god, symbolical of the death of vegetation in winter, and its revival in the spring; and the name "Tragoedia," "goat song," was adopted from the goat sacrificed at this festival. The transition to regular drama by the association of an actor with the choros, and by the invention of linen masks, is assigned to Thespis about 536. Phrynichos, about 512, divided the choros into two for the sake of alteration and contrast, and introduced female characters. Other innovations of this early period were Chaerilos and Pratinas, the latter the inventor of the Satyric drama, usually associated with a tragic trilogy. Besides dealing with the adventures of Dionysos, the Dithyramb dealt with heroic myths, or, as in two of Phrynichos' plays, with real events of history.

The festival of the rural Dionysia, with its wild songs and exhibitions of gross symbols, gave rise to Greek comedy. The earliest historical personage connected with it is Susarion, B.C. 580, but it was probably not fully perfected until Kratinos, 423. During the great period of Athenian history, the golden age of the drama, dramatic invention was stimulated by competition for prizes at the two great Dionysiac festivals, assigned by judges chosen by lot, and by the regular occurrence of these Athenian taste was gradually educated; the contrast between the three great tragedians and Thespis being comparable to that of the Elizabethan drama and the Mediæval mystery-plays, with their strange mixture of blasphemy and indecency.

At the Eleusinian rites in honour of Demeter were representations called *dromena*, things acted, teaching the Persephone legend; similarly at Delphi was shown the slaying of the Python; and probably dramatic performances of the local legend were general elsewhere also. In Sicily a contemporary development took place under the tyrants; the most distinguished Greek poets were attracted to the court of Hiero, the plays of Aeschylos were acted at Syracuse, and he composed his last drama on the occasion of the founding of Aetna. Aristotle ascribes to this period the invention of comedy by Epicharmus; he was a Coan brought up in Syracuse between 550 and 460, of whose forty plays we have only fragments and scattered notices. Their subjects are chiefly mythological, and probably had a burlesque tendency suited to the lighter vein of the Sicilian Dorians; it was, moreover, his idea to base his comedies on the scenes and characters of real life, not like Aristophanes with a direct political purpose, but in the Horatian vein of sarcasm against the vices and follies of the age, tempered with philosophical sayings, "instructive," as Theokritos says, "to the rising generation."

Apart from our own judgment of these works, the literary evidence of the ancient dramatists which have survived, we have the contemporary criticism of the age as to Æschylos, Sophocles, Euripides, and Agathon put on record in the "Frogs" of Aristophanes; we have the dogmatic rules of the succeding age in the "Poetics" of Aristotle, which have largely influenced the French dramatic school. In Augustan times we have the "Ars Poetica" of Horace, embodying the canons of criticism accepted then, and for the most partal so now. The notices of stage matters in ancient authors have been carefully collected in A. Müller's "Griechische Bühnen-alterthümre," the most important being those of Vitruvius and Pollux. In Greek inscriptions we have most important evidence. In the fourth century B.C. the titles of all the plays which gained the prize were inscribed on marbles called didaskaliae, and it was from these that Aristotle compiled his work of that name. We have, moreover, the actual monuments commemorating Choragic victories, and which we can date exactly. In the British Museum is an inscription recording the terms on which the deme of the Peiræus grants the lease of a theatre to a lessee; from inscriptions also we have a large amount of information about the dramatic guilds, "the artists of Dionysus," who were largely patronised by the post-Alexandrian kings.

The most important materials are the remains of Greek theatres, of which we have traces of more than 160 scattered over Greece and lower Italy. One of the best examples is that of Epidaurus explored in 1881–3, which shows the whole of the seats, the orchestra, and a part of the stage. The large preponderance of theatres in Asia Minor is due to the number of new cities founded there after the conquests of Alexander, and which grew in wealth while those in Greece itself declined, and to the "artists of Dionysos." Theatres did not provoke the Iconoclastic spirit which destroyed temples, and in some cases were even preserved for shows; and we may hope that many more discoveries may be forthcoming. They are likely to yield rich harvests of the sculptures which decorated them; statues of public men, subjects in relief, and even sepulchral monuments may be looked for, the theatres having served as well for town-halls, and having become in the third century the ordinary place of meeting for the people. It was in the theatre at Ephesos that the indignation meeting occasioned by St. Paul's visit was held, and in one of the passages leading to the theatre Salutaris' beneficent endowment of the Artemisium was inscribed. From Iasos we have among other interesting records of donations to the dramatic performances, a decree passed by the Dionysiac artists of Ionia allowing certain actors and musicians to act at Iasos on a special occasion; in this decree a fine of 40*l.* is inflicted on any performer who fails to fulfil his engagement without valid excuse.

The decline of the Greek stage in the last three centuries B.C. is strikingly shown by the base uses to which the theatre was sometimes put. Dio Chrysostom tells us how the Athenians introduced gladiatorial games into the Dionysiac theatre, and describes with indignation how the very seats where the hierophant and priests of the god sat in the front row were polluted by the blood of butchered gladiators.

Appointments.—At a Council Meeting of the Dorchester Corporation, held last Tuesday, Mr. F. T. Maltby, C.E., of Durham, was unanimously elected Borough and Waterworks Engineer. There were nearly 150 candidates for the appointment. —— Mr. Walter Thomas Assoc. M.I.C.E., has been unanimously appointed Borough Engineer and Surveyor at Dover, out of 158 applicants.

TWO DISUSED BURIAL GROUNDS, AND THE OPEN SPACES ACT, 1887.

Two large projects have been undertaken in terms of the provisions contained in the Open Spaces Act, 1887. The vestries and churchwardens of the two parishes of St. Mary, Paddington, and St. George, Hanover-square, intend, respectively, to apply for faculties to enable them to throw open the disused parochial burial-grounds as places of public resort. The former graveyard lies around St. Mary's Church, by Paddington-green. The latter, not so commonly known, being hidden from sight, is situated behind the Grosvenor (Episcopal) Chapel in South Audley-street, and between South-street and Mount-street. In each instance the faculty sought for will extend to the improvement and laying-out of the ground, together with the removal or transposition of monuments and tombstones therein. Statements have accordingly been prepared of such names and dates as yet remain recorded, together with plans to show the present situation of the memorial stones.

The parish of St. George, Hanover-square, was taken out of that of St. Martin-in-the-Fields in 1725. It was in July of that same year that Sir Richard Grosvenor entertained his prospective tenants and lessees that he might settle with them for the names of the streets that had just been planned in the neighbourhood of the already existing Grosvenor-square. The freeholder, Sir Richard, who succeeded to his father in 1700, was eldest son of Sir Thomas Grosvenor, of Eaton, third baronet; M.P. for county Chester, in the reign of Charles II. and his two successors on the throne; by his wife Mary, only child and heir to Alexander Davis (or Davies), of Ebury, county Middlesex. Alexander Davis had inherited much of his property here from his brother, Sir Thomas Davis, a bookseller by trade, and Lord Mayor for the year 1676-7. Thomas Davis was grand-nephew and heir to Hugh Audley, of the Inner Temple, who died "great" by repute, and certainly "rich," on November 15, 1662. Audley's London estate was fairly coterminous with the ancient sub-manor of Hyde; just as the Ebury inheritance represented another equally ancient sub-manor,—that of Eyebury, the present Pimlico and Belgravia. These two sub-manors, together with Neyte, or Neate (Kensington Gardens), had made up the Eia Manor, computed in Domesday Survey as extending over ten hides: about 900 acres. At the Conquest, Eia Manor was held by Asgar, in virtue of his office as Stalre, or Master of Horse, to the king. William I. gave all the lands held *ex officio* by Asgar to Geoffrey de Magnavilla, ancestor to the De Mandevilles, Earls of Essex, of that house. Subsequently, Geoffrey gave his manor of Eia to what Dean Bradley has lately reminded us should be correctly styled the Collegiate Church of St. Peter at Westminster. The monks held the land of Hyde, for sport, pannage, and pasture, during a term of nearly five centuries. Then by a conveyance recited in the Act 28 Hen. VIII., c. 49, and dated July 1, 1537, they transferred to the king "the scite, soyle, circuyte, and procyncte of the manor of Hyde, wyth all the demayne, landes, tenementes, rents, meadowes, and pastures of the said manor . . . . which now be in the tenure and occupation of one John Arnold." By a contemporary survey, Hyde is valued to return 140*l.* yearly. Eventually, King Charles I., *circa* 1635, threw open the park and what had been the royal hunting-grounds and preserves for public enjoyment. Since curtailed, it was measured in 1790 as 394½ acres.*

At the death, in 1805, of William, Duke of Gloucester, King George III.'s brother, Robert, second Earl of Grosvenor, removed from Peterborough House, Millbank, which was demolished four years afterwards, into the now Grosvenor House, May Fair. He was great-grandson to the above-cited Sir Thomas Grosvenor and grandfather to the present Duke of Westminster. Mount-street derives its name from one of the fortifications that were thrown up around London by the Parliamentarian force in 1643. "Oliver's Mount" lay at the northern end of Walnut Tree Walk, along the park's eastern side, where a garden and fountain, until recent years a reservoir, stand at this day. The additional burial-ground for this parish in the Bayswater-road was made in 1764.

Paddington forms one of the latest additions to modern London. At the end of last century the village of Padynton, isolated and remote, had but 341 houses, with a population barely exceeding 1,500 souls. It preserved its pristine and rural character until it was brought into regular communication with the town by the running of Miles's one pair-horse coach. Next to that followed, in 1827, John Shillibeer's two three-horse omnibuses,—after William Huskisson's idea,—starting from the Bank and the Yorkshire Stingo, by Lisson Grove Manor-house. Miles's boy would relieve the tedium of a three hours' journey by playing upon his fiddle; a newspaper,—and papers could not then be bought for a penny,—was handed to Shillibeer's twenty-two inside passengers. The construction of the canal and basin, together with the Grand Junction Waterworks, and (1838) of Brunel's railway to the west with its terminus, served to accelerate the rapid change.

Paddington is mentioned neither in Domesday Survey, nor by any of those earlier writers to whom we naturally turn for accounts of, or passing references to, the topography of London. William Robins, historian of the parish, conjectures (1853) that the Pœdings who were settled here in the great forest before the Conquest, had migrated from the Surrey Paddington, or Padendene, which is cited in William I.'s survey. Newcourt, in his "Repertorium," quotes two grants of land here by Ædghar to West Minster. That these charters are genuine we are not prepared to maintain. The present parish was formerly divided into the manors of Westbourne and Paddington, these being separated by the West Bourne and its affluent the Kil Bourne. They both, originally, belonged to the collegiate Church of St. Peter. The latter, after a temporary alienation, reverted to its former owners. For there is an authentic transfer of 31 Hen. II., under which William and Richard de Padynton convey their holding to Abbot Walter. The abbot devised (1191) the manor and its profits to the monks for masses and for certain specified regalements upon each anniversary of his decease. A rectory existed here *temp.* Richard II., and this, as appears from Henry VIII.'s "Valor Ecclesiasticus," yielded a separate revenue to the Minster. According to the Subsidy Roll of that reign the inhabitants did not exceed 120 in number. At the Suppression, Paddington, together with its rectory, was made into part of the endowment for the short-lived see of Westminster. King Edward VI. gave them to Ridley and his successors in the see of London, when they were let for 41*l.* 6s. 8d., to which were added 20s. for the thirty acres of Paddington Wood. Westbourne was made over by the King to the Dean and Chapter of Westminster.

Paddington parish church seems to have been at one time a chapel of ease to St. Margaret's, Westminster; and is believed, though upon but slender grounds, to have been dedicated to St. Katharine. This was pulled down in 1678, and a new structure, dedicated to St. James, was erected in its stead by Daniel and Sir Joseph Sheldon, lessees under Sheldon, Bishop of London. The Sheldons' church consisted of a nave and chancel, with western belfry and spire. In 1788 an Act was obtained for enlarging the churchyard, and for rebuilding the parish church. Thus, on a site about 250 ft. south of St. James's, was built the existing church of St. Mary,—square in plan with a bay in each side,—after the designs of John Plaw.* The now detached burial-ground to the north of that under review was opened by Lord Meath to the public on April 23, 1885. It includes the site, still to be traced, of old St. James's Church. Half-way up, along the eastern walk, will be found the monument,—a stone cross,—erected by his widow to the memory of William Collins, R.A., in lieu of the stone he had placed there to his mother and brother. Beyond, on the same side, are the railings around a large flat stone which is inscribed at the foot,—"Sacred to the memory of Sarah Siddons, who departed this life June 8th, 1831, in her 76th year." Close by Mrs. Siddons's grave, on some rising ground to the north, is a head-stone over the grave of B. R. Haydon. Haydon's epitaph is as follows:—

> "He devoted forty-two years to the improvement of the taste of the English people in high art, and died broken-hearted from pecuniary distress.
> —— O let him pass! he hates him
> That would upon the rack of this tough world
> Stretch him out longer."

* The Hyde is the name of a little village in Kingsbury and Hendon parishes, just beyond Silk Bridge, on the Edgware-road.

* St. James's, Westbourne-terrace, was constituted the parish church in 1845. The new fabrics were begun in 1882. The late Mr. Street's designs were carried out by Messrs. A. E. Street and Blomfield.

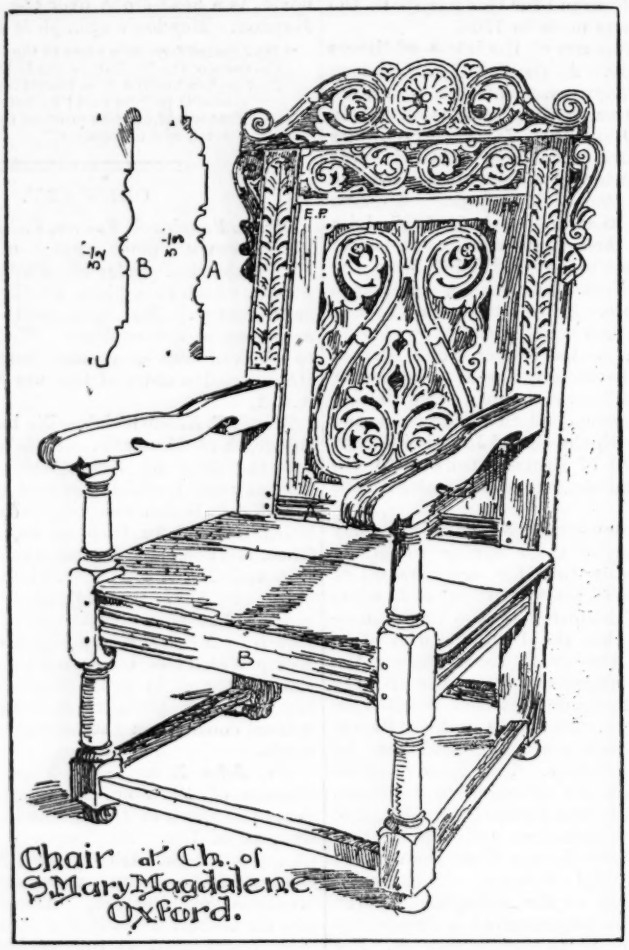
OBITUARY.

Mr. R. Popplewell Pullan, F.R.I.B.A., F.S.A.—We hear with much regret of the death of Mr. Richard Popplewell Pullan, F.R.I.B.A., F.S.A., which took place on the 30th of April at Brighton. He was well known as an archæologist and explorer. We hope to be able to speak of him at greater length next week. He married a sister of the late William Burges, A.R.A.

Mr. S. E. Kemp-Welch.—We have to announce the death of Mr. S. E. Kemp-Welch, architect (of the firm of Kemp-Welch & Pinder, of Bournemouth), which occurred on the 27th ult. Mr. Kemp-Welch was originally in practice in Salisbury, and in 1873 he was joined by Mr. Thos. Reynolds, of Bournemouth, and in 1876 they took Mr. Reginald G. Pinder into partnership. In 1877 Mr. Reynolds died, and the practice has since been carried on in Bournemouth by Messrs. Kemp-Welch & Pinder. Mr. Kemp-Welch has been in ill health for some time past, and in consequence of this, and at his wish, the partnership was dissolved by mutual consent on the morning preceding his death.

Mr. John Bacon.—We have to record the decease of Mr. John Bacon, for nearly fifty years the Clerk of the Works to the Dean and Chapter of Ely. Mr. Bacon, like the late Mr. Chapple, of St. Albans, and Mr. Austen, of Canterbury, was an enthusiastic admirer of Mediæval architecture. Associated with the late Sir Gilbert Scott in the restorations which were commenced at this cathedral well nigh half a century since in the interior of the western tower, transept, and eastern limb, and more recently at the central dome and lantern, together with the pavement of nearly the whole of the floor, and the painting of the ceiling of the nave, Mr. Bacon's extensive knowledge of the building, aided by that of his father, who for nearly thirty years filled the same office, was of much advantage in ensuring the accuracy and fidelity of the restorations. But it was not only to the cathedral of the city in which he resided that Mr. Bacon's labours were confined, for he designed and superintended the erection of the church at Prickwillow, and was also engaged in the restoration of churches under the patronage of the Dean and Chapter at Witchford, Sutton, Lakenheath, Thetford, and other places. Mr. Bacon wrote a history of the cathedral in continuation of Bentham's, including the recent restorations of the cathedral, together with that of the monastic buildings, which was published in the *Churchman's Magazine* of 1875, and within the last year a description, with illustrations, of numerous ancient fragments formerly belonging to the cathedral and monastery. Mr. Bacon was eminently a self-taught and practical man, and was much esteemed by those who knew him.

Mr. Thomas Russell Crampton, M. Inst. C.E.—A well-known engineer has passed away in the person of Mr. Thomas Russell Crampton, M. Inst. C.E., whose death at the age of 71 was announced a few days ago. Mr. Crampton, who was born in 1816, at Broadstairs, Kent, was articled to Mr. John Hague, M. Inst. C.E., of London, where he obtained a knowledge of mechanical engineering, and where (according to the *Times*) he was a fellow pupil of Sir Frederick Bramwell. After serving his pupilage, he was engaged under the elder Brunel for several years, and afterwards with Mr., now Sir Daniel, Gooch, under whose direction he designed the first locomotive for the Great Western Railway. He afterwards held a responsible position under Messrs. Rennie, and in 1848 commenced practice on his own account as a civil engineer. He undertook the whole engineering responsibility in the first practical step in submarine telegraphy, the laying of the first successful cable from Dover to Calais. Among the numerous works executed by Mr. Crampton, either by himself or in conjunction with others, may be mentioned the Berlin Waterworks, in which he was associated with the late Sir Charles Fox; the Ottoman Railway from Smyrna to Aidin; the Varna and Rustchuk Railway; the East Kent Railway



from Strood to Dover; the Herne Bay and Faversham Railway; the Sevenoaks Railway to Swanley, and after the various lines became absorbed into what is now known as the London, Chatham, and Dover Railway, he was interested in the construction of other portions of that system.

Mr. Seth Bevan.—Mr. Seth Bevan, a builder well known in the West of England, died at his residence, Mutley, Plymouth, on the 29th ult., from the effects of a gunshot wound inflicted by himself two days before. He was fifty-eight years of age, and leaves a widow and grown up family. He carried out many important contracts in the West of England. The new Post-Office at Exeter and the extensive establishment of the Little Sisters of the Poor at Plymouth were erected by him. He was also builder of the ill-fated theatre at Exeter. At the time of his death, he was, amongst other contracts, carrying out one for Government, which consists of levelling the fortifications and filling in the trenches that have, until now, encircled Devonport, and which the authorities have decided to do away with. The Coroner's Jury brought in a verdict of temporary insanity, and those who know him entertain no doubt that the terrible event on the 5th of September last, when 200 ill-fated people met their death by the destruction of the theatre at Exeter, seriously affected his mind.

The Irish Exhibition in London.—We are informed that the Executive Council have decided to give special prominence to the Women's Industries Section in connexion with the Exhibition which is to open at Olympia, Kensington, on the 4th of June; and that an influential Council of Ladies, including the Duchess of Abercorn, the Countess Aberdeen, Countess Bective, Lady Arthur Hill, Mrs. Ernest Hart, and Mrs. Horne Payne, is now being formed. Both throughout England and Ireland Ladies' Local Committees are to be arranged, whose object it will be to gather and supply articles of every description for sale in this section. The architectural and antiquarian knowledge of Mr. G. H. Birch is to be brought into play, and an old Irish Street or Market Scene will be built, and the attendants, many of whom will be ladies of distinction, will sell at these mimic shops, dressed in appropriate costumes. The profits of the Exhibition are to be devoted to the Industrial Training Schools in Ireland.

CHAIR, ST. MARY MAGDALEN CHURCH, OXFORD.

THIS is a good example of a type of Renaissance chair, of which a good many examples exist in church vestries in different parts of the country; they are all much alike in general design, especially in constructional treatment, but with much variety of decorative detail.

Considering the apparently solid make of these chairs, the idea of the necessity of a tie-rail round the feet, which is nearly always found, is curious. It is an inconvenient addition, and seems a kind of confession that the makers were not sanguine as to the solidity of their construction without this assistance.

OTLEY SEWERAGE AND DRAINAGE.

AT a recent meeting of the Otley Local Board the question of dealing with the sewage of the district was under discussion. The chairman (Mr. T. A. Duncan) presented the following report:—

"As agreed upon at the last meeting, Mr. Johnston, Mr. Dawson, and myself visited the sewage disposal works at Pontefract. I do not think we found anything very remarkable. The town has a population of about 9,000 inhabitants, and very few manufactures at all. The town is water-closeted very well throughout, and the sewage is considerably polluted. They have not the separate system, so that the water finds its way into one common sewer, but the storm water does not pass into the tanks to be treated, but is carried direct into the stream. The works consist of four large settling-tanks, and the process is one of precipitation by lime, and it is carried out in a very small building of two stories. Through the basement the sewage passes in an open channel, and here it is mixed with the lime. Here a rather ingenious system is adopted, as the sewage itself is made to turn a little water-wheel of 3 in. or 4 in. in diameter, and causes the lime to be mixed with a certain quantity of sewage, the lime finding its way from a hopper. The surveyor explained that the hopper held a sufficiency of lime to enable the works to go all through the night. It is a rather clever plan, because the greater the flow of the sewage the more rapidly is the lime put into the receiver. The sewage then finds its way through the channel into the tanks, which number four, and finally through a filter bed, which is composed chiefly of gravel and sand. After a week or so, the first tank is emptied, and the sludge run on to a filter bed, and there allowed to dry or lose a good deal of its moisture, and finally it is dug up, wheeled out on to the land, put into heaps, and sold by auction to the farmers, who pay about 1s. 6d. per ton, which is a very small price. As I tried to explain before, there are very great objections to this lime process. Not only is it impossible to get a good effluent so long as you treat your sewage with lime, but at the same time the tillage which you make is really spoilt for farming purposes. I cannot, for myself, see that we should be wise in adopting the lime process of precipitation for Otley; indeed, I question whether the Local Government Board would sanction such a system. We had no opportunity of seeing the effluent at Pontefract, because it went through a kind of culvert, to which we had no means of access."

In answer to questions it was stated that the annual expense of these works was about 170*l.*, and that 70*l.* or 80*l.* was made out of the manure. After some discussion (in the course of which it appeared that the Local Board was threatened with an injunction by the riparian owners) of the relative merits and possibilities of precipitation and irrigation, it was resolved that an advertisement be inserted in the *Engineer* and the *Builder* offering a premium for the best plan for constructing an intercepting sewer, and the best system of dealing with the sewage of the town of Otley. (The advertisement in question appeared in a recent issue of the *Builder*.)

ART-UNION OF LONDON:

ANNUAL MEETING AND PRIZE DISTRIBUTION.

THE annual meeting of the Art-Union of London was held on Tuesday afternoon in the Adelphi Theatre, by permission of Messrs. A. & S. Gatti. In the unavoidable absence of the President, the Right Hon. the Earl of Derby, Mr. James Hopgood, a member of the Council, was called upon to preside.

Mr. J. H. Hallett read the annual report, of which we print the greater part. The report said:—

On the present occasion the Council have to report that the subscriptions for the year just closed amounted to 6,269*l.* 11*s.*, being less than they had hoped to be able to report. This disappointment may be found first in the depression still felt in all parts, which especially affects the income of all institutions relying on voluntary subscriptions, there being a general tendency to cut down all items of expenditure not absolutely necessary. Again there is no doubt that the scheme set on foot by the Institute of Painters in Water-Colours has carried off a large number of guineas which would have otherwise found their way to the coffers of the Art-Union. The fact of the acquisition for nothing of the works to be given as prizes by the promoters of the new scheme gives them an enormous advantage through the temptation they are thus enabled to offer, over one in which all the works given as prizes have to be paid for. It is announced that this movement is only intended to cover one year, and it may therefore be hoped that the strayed contributors will return next year to the original fold. The subscriptions with reference to her Majesty's Jubilee have doubtless also absorbed moneys that might have been sent to the Art-Union.

The following is a brief summary of the receipts and expenditure; a detailed account will, as usual, be printed in the report:—

Amount of subscriptions			£6,269 11 0
Allotted for prizes	£1,180 0 0		
Set apart towards providing works of art for accumulated payments	481 13 0		
For print of the year, exhibition, report, and reserve	1,983 18 4		
		3,625 11 4	
Agents' commission and charges, advertisements, printing, postage, rent, &c.		2,643 19 8	
			£6,269 11 0

To the local honorary secretaries and agents in all parts of the world we have, as usual, to express the thanks of the Art-Union, especially to Mr. Bonsor, of Balham, and Mr. Wilsden, of King's-cross.

The amount to be expended on prizes will be thus allotted:—1 work at 100*l.*; 1 work at 50*l.*; 2 at 40*l.* each; 4 at 30*l.*; 4 at 25*l.*; 6 at 20*l.*; 10 at 15*l.*; and 12 at 10*l.*; also 80 sets of designs from English history; 25 silver "Jubilee" medals; and 35 bronze "Jubilee" medals, making, with the prizes given to unsuccessful members, 380 prizes.

With a view to make generally known some of the results of the Society's work, an exhibition in our galleries of a selection of paintings in oil and water-colours from prizes of recent years was formed, and remained open free to the public during the months of March and April. The quality of the work for the most part elicited warm commendations of the judgment shown by the prizeholders in choosing their works. . . . .

Since the last annual meeting, the Art-Union has lost, by death, the services of Mr. Geo. William Reid, F.S.A., for many years a valued member of your Council, and some time Keeper of the prints and drawings in the British Museum. In 1843, Mr. Reid became an assistant in the Print Department, and continued in that post nearly twenty years, and in August, 1866, he was, with universal approval, made Keeper. He was the author of numerous works on fine art.

On the 27th of January last died Mr. George Godwin. This inflicted on the Art-Union one of the greatest losses it has ever sustained. Mr. Godwin was one of the founders of the Society, and up to the day of his death, one of the most active and energetic members of Council. Mr. Godwin was well known as an architect and as an author. Amongst his works may be mentioned the restoration of the magnificent church of St. Mary Redcliffe, Bristol; the erection of the Colney Hatch Lunatic Asylum; St. Mary's Church, Ware, and many others. But for some years he had given up the practical work of an architect, and devoted himself to literature, his time being almost exclusively occupied in the editorship of the *Builder*, a paper which, under his able guidance, became the leading organ of the architects and the building trade. Mr. Godwin acted for many years as Honorary Secretary of the Art-Union in conjunction with the late Mr. Pocock, and gave constant and close attention to all its proceedings,—never failing to call in at least once a week to inquire as to the work of the office.

The Art-Union of London having just completed its jubilee year, the Council think the time opportune to lay before the members a brief account of the early operations of the Society, and the progressive steps by which it has attained a success unprecedented in the history of similar associations.

There existed in the year 1836-7 a private club of gentlemen who met, on certain evenings, to discuss current art and literature, at the house of a Mr. Edward Edwards, of 35, London-street, Fitzroy-square. Amongst them were Mr. George Godwin, Mr. Lewis Pocock, Mr. Henry Hayward, and others. The last named, Mr. Hayward, having read of the German Kunst-Vereine, conceived the idea that an art society, different in principles from one which had been tried in London and had failed, would succeed in England. He called upon Mr. Edwards, and, after explaining his views, they went together at once to Messrs. G. Godwin, Lewis Pocock, Ed. Hawkins, and others, to propose their adhesion, and they agreeing, a provisional committee was formed, out of which grew the Art-Union of London. The first tentative meeting was held at the House of Mr. Henry Hayward, of Edward-street, Portman-square. The first general meeting was at Rainey's Gallery, Regent-street. In one important particular the scheme adopted by the Art-Union of London differed from that which prevailed in other similar institutions, for, after much discussion, it was resolved that, whereas, in the existing systems, the works to be given as prizes were selected by the Committee, or other governing body, in the case of this Society the selection of prizes should be confided to the prizeholders themselves. It was felt that their interests would be thus far more strongly excited, and that the great object of the movement,—the inspiring a love for art and an appreciation of its merits,—would be thus encouraged. It was thought that, though it could not, of course, be supposed that the same person would gain a prize year after year, and improve his art knowledge by the operation of selecting, yet every member visiting an exhibition would feel the possibility of being himself some day a prizeholder, and would examine the works and try to understand the principles on which one picture might be better or worse than others, with the view to having to choose for himself the best and most valuable work attainable. During the continuance of the Society the managers have never had reason to repent of the arrangement thus made, and the great improvement in the quality of the works selected has been repeatedly and forcibly expressed by those competent to judge. A special feature in the programme was the exhibition every year to the members, as well as to the general public, of the works selected by prizeholders; and though, through the multiplication of exhibitions, the attendance of late years has been scanty, yet, some thirty years ago, when the works were exhibited at the Society of British Artists, in Suffolk-street, the gallery being open at night, so great was the throng of visitors that it was necessary to have the attendance of police-constables to regulate the crowd, which had to be admitted by detachments. The amount subscribed in the first year was 489*l.*, and the whole was expended in the purchase of works in oil and water-colour.

In the second year of its existence the Society adopted the principle of setting apart a certain sum for the purpose of engraving a picture, that each member might have an impression of the plate, and by the combination of large numbers, it was possible to give to every one a work of the market value, at least, of his subscription, and yet leave a large surplus to be expended in prizes.

The work selected for this purpose in that year was a painting by Mr. Simson, of a "Camaldolese Monk showing the Relics of his Convent," and was engraved by Mr. W. Giller. This print was the beginning of a series of line engravings of a magnitude which has never, we believe, been equalled by any other source, and, to anticipate our narrative a little, we may state the number of impressions of some of our plates, by the first of English engravers, after the works of the greatest of English artists:—

	Impressions.
Of the "English Merrymaking," after Frith—were distributed	23,171
"Wellington and Blucher," after Maclise	23,644
"The Death of Nelson," after the same...	21,026
	67,841

In all these cases, by the wonderful discovery of the processes of electrotyping and steel-facing, the latest impressions are in every respect perfectly identical with those first taken from the plate.

1839. The rise in the amount of subscriptions was unexpectedly rapid. In the third year, 1839, it stood at 1,295*l.*, and the Society began the establishment of relations with gentlemen in the provinces, and in various parts of the world, who acted as agents, and gave valuable assistance in making known the objects and advantages of the Association, and collecting subscriptions, and this movement has been so diligently cultivated that there is scarcely any part of the world to which our publications have not penetrated. Thus, fine specimens of engraving are to be found in the huts of sheep-tenders of distant Australia, in the gold-diggings of California and Central Africa, and all over Canada and the United States,—and, in fact, wherever English-speaking people have settled. . . . .

The report then went on to describe the work and history of the Art-Union, its efforts and successes, down to the present time. We give a few of the more salient paragraphs:—

1841. This year the highest prize of 300*l.*, with 200*l.* added by the prizeholder, Mr. G. Fry, was expended in "The Sleeping Beauty," by D. Maclise, R.A., which has since been sold for upwards of 2,000*l.*

In this year a Committee was appointed "to consider the future prospects, and the most efficient mode of working the enlarged means of the Association." After much consultation, three proposals were agreed to, and submitted to the General Committee and passed.

First. To endeavour to establish the production of artistic statuettes in bronze. So little was known of the art in this country, that Mr. E. W. Wyon, to whom was entrusted the reduction and casting of Flaxman's beautiful group, "Michael and Satan," had great difficulty in finding men able to undertake the mechanical details of the work. However, by dint of perseverance, a very satisfactory copy of the group was produced,—and it was the commencement of that series of bronzes, to which we can point with satisfaction as not yielding in excellence to the works produced by Barbedienne or any other foreign house.

The second move was in the direction of medal-die engraving. It was proposed to produce a pair of dies each year, having on the obverse the head of some distinguished British painter, sculptor, or architect, and on the reverse a subject from one of his works. The first medal thus produced was one of Chantrey the sculptor, by Mr. W. Wyon, having on the reverse his fine sitting figure of Watt, the engineer. This medal, commemorating at once two of England's most gifted men, was the first of that series which is one of the most interesting records of great artists ever produced.

The third result of the sub-committee's recommendations was the offer of a premium of 60*l.* for a series of designs in outline, illustrative of some epoch in British history, or the work of some British author. The object of this offer was to call the attention of our artists generally to that purity and correctness of drawing, and severe beauty of form, which, apart from colour and all effects of light and shade, exist in the compositions of the fictile vases of the ancients, in the outlines of our own Flaxman, and in the works of Reipenhausen and some later Germans.

The result of the above offer was the receipt of thirty sets of designs, of various degrees of merit, and the premium was adjudged to one illustrating "The Pilgrim's Progress," found to be the work of Mr. H. C. Selous. These were of a very high order of merit, and were satisfactorily engraved by Mr. Henry Moses. They are still amongst the works available for subscribers. . . . .

1844. All the preparations for holding the annual meeting were made, the date fixed, &c., when the Committee were startled by the receipt of a letter from the Treasury to the effect that the proceedings of the Art Union were illegal, and that the continuance of the same would render all parties concerned liable to prosecution. The Committee thereon suspended all proceedings. A memorial was addressed to Sir Robert Peel, setting forth the great loss and disappointment which would arise from stopping the distribution of the large amount of money then actually in hand. The Committee were, however, unable to obtain permission to proceed with the drawing. A meeting of artists was held,—numerous petitions were presented,—and, on the motion of Mr. Wyse, a Committee of the House of Commons was named "to consider the whole question of art unions, and what are the most expedient and practical means to place them on a safe and permanent basis and to render them most subservient to the improvement and diffusion of art, through the different classes of the community." In the meantime a temporary Bill was brought in by Lord Monteagle, and passed, to enable the distribution of prizes to take place, and the meeting was held on August 13. The time was subsequently extended to July 31, 1846. The report of the Committee of the House of Commons was a complete investigation of all the points which could be urged for and against art unions, and the conclusions in their favour were thorough and unanswerable. Finally every obstacle was removed, and the Bill legalising art unions received the Royal Assent on August 13, 1846, and on December 1 of the same year this Association was incorporated by Royal Charter.

1845. This year the Committee offered a premium of 500*l.* for an original picture, illustrative of British History. Twenty-eight cartoons were sent in on January 1, 1846, and the premium was awarded to Mr. H. C. Selous for one of "Queen Philippa interceding for the lives of the Burgesses of Calais."

A premium of 500*l.* was at the same time offered for a group or single figure in marble, to be competed for by models in plaster the size of the intended work. In reply, twenty models were received, and the premium was awarded to "The Dancing Girl Reposing," found to be by Mr. Calder Marshall, now R.A. The figure was most successfully executed in marble, and in the year 1863 it was the chief prize in the distribution, and fell to Mr. Kenny, of Brigton, Northampton.

At this time the first experiment of producing statuettes in porcelain was made. A reduction of Mr. Gibson's beautiful figure of Narcissus was placed in the hands of Messrs. Copeland & Garrett, and a very satisfactory result was obtained. This was the beginning of the remarkable series of statuettes and busts which have always been so popular with the subscribers.

With a view to affording encouragement to the art of gem engraving,—but little practised in this country previously,—premiums of 60*l.*, 30*l.*, and 15*l.* were offered for the best cameos in profile of a head of "Minerva" in the collection of bronzes in the British Museum,—and the first and second premiums were awarded respectively to Miss Elena Pistrucci and Mr. H. T. Weigall.

1847. In order to continue the promotion of the connexion between manufacture and art, the Council determined to endeavour to produce some work of excellence in cast-iron. A reduction of the fine cast of "Thalia," in the British Museum, was made by Mr. Nixon, and very carefully produced by the Coalbrookdale Company. This was followed by a vase and two tazzas in iron, of which many hundred copies have been distributed. . . . .

1850. Two premiums of 100*l.* and 50*l.* were offered for the first and second best model of a single figure to be produced in bronze. Forty statuettes were sent in, and of these 24 were selected, and formed a very interesting feature in the first Great Exhibition of 1851. The first premium was adjudged to Mr. Armstead for his figure of "Satan dismayed," and the second for "Solitude," to Mr. J. Lawlor.

In order to emphasise the importance of exercising the greatest care in the selection of works by prizeholders, it may be mentioned that a drawing of "Loch Awe," by Copley Fielding, selected by a prizeholder of £80,—in the year 1850,—was sold at Christie's for 892*l.* 10*s.* . . . .

1862. This year a premium of 600*l.* was offered for a life-size figure or group in marble, to be competed for by finished models in plaster. Fifteen models were sent in, and, by permission of the authorities at South Kensington, they were there exhibited. The premium was awarded to Mr. C. B. Birch, now A.R.A., for a group, "The Wood Nymph." It was reproduced in marble, and in the distribution of 1872 it was drawn as a prize by Mr. E. Hornsby, of Old Change. Many reductions in Parian have been given as prizes.

1865. Arrangements were made with Mr. Stocks for engraving Maclise's noble wall-painting in the Palace of Westminster of "The Meeting of Wellington and Blucher after the Battle of Waterloo." This work gave Mr. Maclise six years of incessant labour, and the plate is one of the most important ever undertaken. The picture contains upwards of eighty heads, besides horses, guns, and other warlike implements, and an infinity of detail. After more than five years' work Mr. Stocks completed his task, and produced a very fine plate. The production of a similar plate from the companion picture, "The Death of Nelson," was entrusted to Mr. Sharpe, also with a most satisfactory result. . . . .

For the coming year the Council think themselves fortunate in having secured the right to engrave a picture by Mr. W. F. Yeames, R.A., now in the Walker Art Gallery in Liverpool, entitled "True and Loyal" ("And when did you last see your father?"). A number of Cromwell's Ironsides have invaded the mansion of a Royalist, and are desirous of getting possession of his person, and are examining some members of the family in order to extort information as to his whereabouts. At the moment represented in the picture a pretty little boy, probably the heir of the house, is being interrogated by some of the civilian members of the band, with a view to entrap him into disclosing how long it was since he had seen his father, hoping thereby to get an idea as to the length of time during which he had an opportunity of escaping. The mother and sister of the boy are watching the proceedings with great anxiety as to how far he may be able to elude the penetration of the inquisitors. One of the soldiers brings forward a sister with a view to her being also examined. In the background a man enters with a brass-bound casket, probably full of treasure, showing that the house is being ransacked. The story is cleverly and touchingly told, and the picture is full of character and action.

The Council having received and approved the above report, it was

Resolved—That in approving the Draft Jubilee Report for the year ending 1888, the Council desire to express their sense of the skill and judgment manifested in its preparation by their secretary, who has framed a most interesting statement of the proceedings of the Society since its commencement.

The Chairman moved the adoption of the report, which, he said, had been so ably drawn up by their Secretary, Mr. Watson, and gave a very faithful idea of the scope and results of the work of the Art-Union of London. The Council had marked their sense of this by passing a special resolution of thanks to Mr. Watson. He regretted that the report was not so cheering as they had hoped for, and he was sorry that they were only about to distribute 800*l.* for the purchase of works of art. He wished it could have been 1,600*l.* But other prizes were to be drawn for, thus materially increasing the amount of the distribution. The subscriptions for the year had amounted to little more than 6,000*l.*,—a very extraordinary falling-off as compared with many previous years. He hoped and believed that that falling-off was not in any way to be attributed to any shortcomings of their own, for, in his opinion, the engravings issued of late years by the Art-Union were equal to anything they had ever produced, and certainly every subscriber got value for his money in the engraving, besides a chance in the allotment of prizes. The Art-Union of London had always prided itself upon the part it had taken in keeping alive the art of line engraving; but if it should turn out to be the case that the public did not want line engravings, it would be futile for the Art-Union to persist in producing them. They must not shut their eyes to the fact that chemistry had taken a prominent part in reproductive processes of late years, and it would be the anxious effort of the Council to adapt its methods of operation to newer requirements, so far as it could do so. They were not without hope that they had many prosperous years before them.

Mr. Zouch Troughton, Hon. Sec., formally seconded the motion, which was unanimously agreed to.

Votes of thanks to Messrs. A. and S. Gatti for the use of the theatre; to Messrs. Jecks & Burns for the arrangements made for the meeting; and to the ladies who had undertaken to assist in the drawing of the prizes, were also unanimously passed.

The drawing for the prizes was then proceeded with, the highest, value 100*l.*, falling to the lot of Mr. R. Ashworth, Hulme, Manchester.

A New Provincial Architectural Society.

A meeting of architectural assistants and pupils was held in Halifax on the 24th ult., Mr. Lister Coates, A.R.I.B.A., occupying the chair, when it was unanimously resolved to form an association, to be called the "Halifax Architectural Association," and to affiliate it with the London Association. Mr. Coates undertook the duties of Honorary Secretary. The first meeting will be held in the Mechanics' Institute, Halifax, on Tuesday next, the 8th instant, when a syllabus will be drawn up of intended classes, &c.

A New Church at Kew Gardens.—On Saturday last the foundation-stone of the new Church of St. Luke, now being built in the Avenue, Kew Gardens, was laid by Captain Selwyn, M.P. When complete the church will consist of a nave and aisles, chancel, organ-chamber, two vestries, and a tower and spire, the lower stage of which will form a baptistery. The materials are Casterton walling stone with Corsham dressings, and the roofs will be covered with red tiles. The architects are Messrs. Goldie, Child, & Goldie, of Kensington-square, and the builder Mr. Dorey, of Brentford.

ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

THE fifth voluntary pass examination of candidates for the offices of Municipal Engineer and Local Board Surveyor, carried out by this Association, was held at the Institution of Civil Engineers, Great George-street, Westminster, on Friday and Saturday, April 27 and 28, 1888.

Twenty-three candidates presented themselves for the examination, the written portion of which was taken on the first day, while the *vivâ voce* portion of the examination occupied the greater portion of the second.

The examiners were :—I. Engineering as applied to municipal work, Joseph Gordon, M.I.C.E., Borough Engineer, Leicester (President of the Association. II. Building construction, W. Geo. Laws, M.I.C.E., City Engineer, Newcastle-on-Tyne (past President). III. Sanitary Science, H. P. Bouluois, M.I.C.E., Borough Engineer, Portsmouth (Vice-President). IV. Public Health Law, E. B. Ellice Clark, M.I.C.E. (London), Vice-President; and C. Jones, A.M.I.C.E., Ealing (past President).

LEEDS AND YOKSHIRE ARCHITECTURAL SOCIETY.

A MEETING of the members of this Society was held on Monday evening last. Mr. G. F. Danby presided.

The following gentlemen were appointed officers for the ensuing year:—Mr. H. Perkin, President; Mr. G. F. Danby and Mr. S. Robinson, Vice-Presidents; Mr. J. B. Fraser, Hon. Treasurer; Mr. W. A. Hobson, Hon. Librarian; Mr. J. H. Greaves, Hon. Secretary; Mr. C. H. Thornton, Mr. J. G. Walker, Mr. W. H. Thorp, Mr. H. Hodgson, Mr. A. Neill, and Mr. G. B. Bulmer, Members of the Council.

Mr. J. H. Greaves read the Report of the Council, which stated that they had once more to announce an increase in the number of members. The list of prizes published on the syllabus, although a generous one, had commanded but few competitors, no drawings being received for the Society's silver medal. The President (Mr. C. R. Chorley) had kindly handed over his additional prize of five guineas for the benefit of the library. The following is a list of the awards:—Prize of three guineas for the best design for a monument to a statesman, Mr. A. E. Dixon; prize of three guineas for drawing of the construction of church roofs, half to Mr. A. E. Dixon. The Associates' Sketching and Art Club now numbered twenty-four members. The total number of drawings sent in during the summer session was 124, and these drawings obtained an average number of 6·7 marks each, the maximum number being fixed by the adjudicators at 15 per drawing. Mr. A. E. Dixon's sketches were awarded the prize of two guineas, having obtained the highest number of marks, 255½, his thirty-four drawings averaging 7·5 marks per drawing. Two sketches by Mr. A. Whitehead obtained the highest average, 11·8 marks. Subjects were announced for the winter session, and Mr. A. E. Dixon obtained the highest number of marks for plans of stables, &c., to cost 400*l.*; and Mr. A. E. Kirk the highest number of marks for plans for village club, to cost 600*l.* A selection of drawings were, in response to an invitation from the Glasgow Exhibition authorities, forwarded for the purpose of being hung in a gallery which will be provided to display architectural works. The drawings of the following gentlemen were selected by the Council:—Messrs. F. A. Buttery, N. E. and A. Brown, T. Butler, Wilson, Chorley & Connon, George Corson, E. J. Dodgshun, G. F. Danby, N. Neill, Perkin & Bulmer, and W. H. Thorp.

The report was adopted, and votes of thanks were passed to the President and officers for their services during the year.

Archæological Discovery in Milan.—During the relaying of a portion of the Via Torino, in Milan, the remains of another street, three metres wide, have been discovered below, which appears to have been paved with the same kind of stones as those used in Pompei. There are still distinct traces of wheels. Close by it, near the celebrated Guocchi *café*, a wine and oil cellar was discovered, at a depth of seven mètres, containing various ancient amphoræ and other vessels.

THE INSTITUTE OF BUILDERS.

THE fourth annnal dinner of the Institute of Builders was held on Wednesday evening, the 25th ult., at the Grand Hotel. There was a large company present, and the visitors included Sir Philip Magnus, Mr. Thomas Blashill, Mr. A. W. Blomfield, A.R.A.; Mr. Arthur Cates, Mr. Charles Fox, Rev. Jos. Harris, M.A.; Mr. E. S. Henshaw, Mr. L. H. Isaacs, M.P.; Mr. L. J. Maton, Mr. T. M. Rickman, and Lieut.-Col. Sewell. The following members were also present:—Messrs. H. T. Ashby, H. H. Bartlett, S. G. Bird, Wm. Brass, Geo. Bird, jun.; J. M. Burt, W. A. Colls, J. H. Colls, Wm. Denne, Wm. Downs, W. R. Freeman, J. Grover, Thos. Hall, W. Hill, W. S. Horner, A. T. Kinninmont, H. Lea, A. J. Mansfield, J. Marsland, Frank May, T. F. Rider, H. I. Sanders, Wm. Shepherd, R. J. Waller, and Samuel Wheeler.

The President, Mr. George Burt, D.L., J.P., occupied the chair.

The usual loyal toasts were proposed, Lieut.-Col. Sewell replying for the Navy, Army, and Reserve Forces.

The Chairman next proposed the Houses of Parliament, for which Mr. L. H. Isaacs, M.P., responded.

Mr. H. T. Ashby proposed "Science and Art," to which Sir P. Magnus and Mr. A. W. Blomfield, A.R.A., responded.

The toast of the "Architects and Surveyors," proposed by Mr. H. H. Bartlett, President of the Central Association of Master Builders of London, was replied to by Mr. Thomas Blashill and Mr. Arthur Cates.

The "Past Presidents" having been proposed by Mr. John M. Burt, was responded to by Mr. J. Howard Colls, the previous President.

The Rev. Joseph Harris, M.A., replied for the "Visitors" in a most amusing speech.

The "Institute of Builders" was proposed by the Chairman, and enthusiastically received.

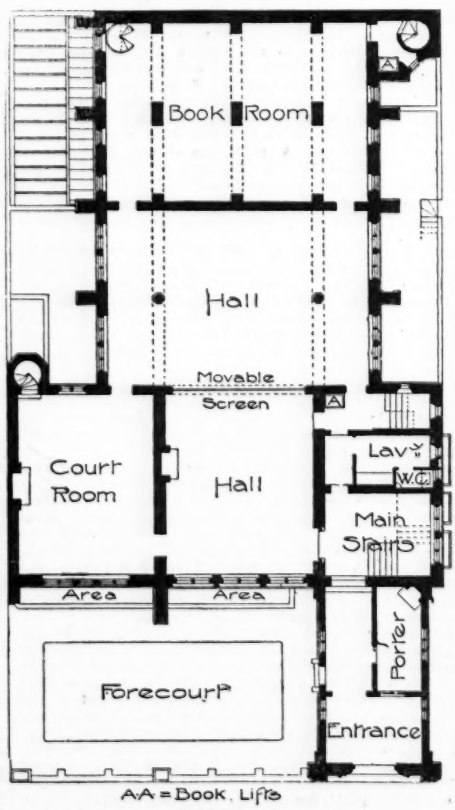
Mr. Thos. F. Rider then proposed the health of the "President," and spoke of the pleasure it gave the members to have as their President one who, although he was now enjoying the leisure which many years of work entitled him to, yet still retained such interest in the trade he had been engaged in as to undertake the onerous position of President of the Institute of Builders.

Mr. Burt briefly responded, thanking those present for the kind reception they had accorded him.

Illustrations.

SION COLLEGE.

WE give a detail elevation of this building, designed by Mr. Blomfield, A.R.A.: we gave a perspective view of the design for the building, with a description, in the *Builder*, vol. xxxviii., page 542.



Sion College.—Ground Plan.

We append a plan of the ground floor. There is a librarian's room on the first floor, over the court-room, and a smoking-room on the second floor, over the main stairs, &c., also a room over the porch; the rest of the upper part of the building is a large library. There is another large book-room and kitchens, &c., in the basement.

WALL PAINTINGS AT MOUNT-STUART HOUSE.

THESE subjects form a frieze of about 5 ft. high on the walls of a large apartment in Lord Bute's new residence near Rothesay, in the Isle of Bute. The Queen of Scotland incidents from whose life are here illustrated was Margaret, a direct ancestress of our present Queen, grand daughter of Edmund Ironside, and sister to the Æthling Edgar who had been chosen King after the death of Harold on the field of Hastings. On the successful advance of William the Norman into England, Edgar, with his mother and sisters, took refuge at the court of the King of Scotland, Malcolm Ceanmore, to whom, though she was inclined to a religious life, Margaret was eventually married.

Mr. Freeman, the historian of the Norman Conquest, says:—"It was a good day for Malcolm and for Scotland when Margaret was persuaded or constrained to exchange the easy, self-dedication of the cloister for the harder task of doing her duty in that state of life to which it had pleased God to call her. Margaret became the mirror of wives, mothers, and queens, and none ever more worthily earned the honours of saintship. Her gentle influence reformed whatever needed to be reformed in her husband, and none laboured more diligently for the advance of temporal and spiritual enlightenment in her adopted country. Her life was written by the holy Prior and Bishop Turgot; it is one of the most interesting pieces that we have as a personal and ecclesiastical biography."

Skene, in his "Celtic Scotland," is of opinion that "there is perhaps no more beautiful character recorded in history than that of Margaret. For purity of motives, for an earnest desire to benefit the people among whom her lot was cast, for a deep sense of religion and great personal piety, for the unselfish performance of whatever duty lay before her, and for entire self-abnegation, she is unsurpassed, and the chroniclers of her time all bear testimony to her exalted character."

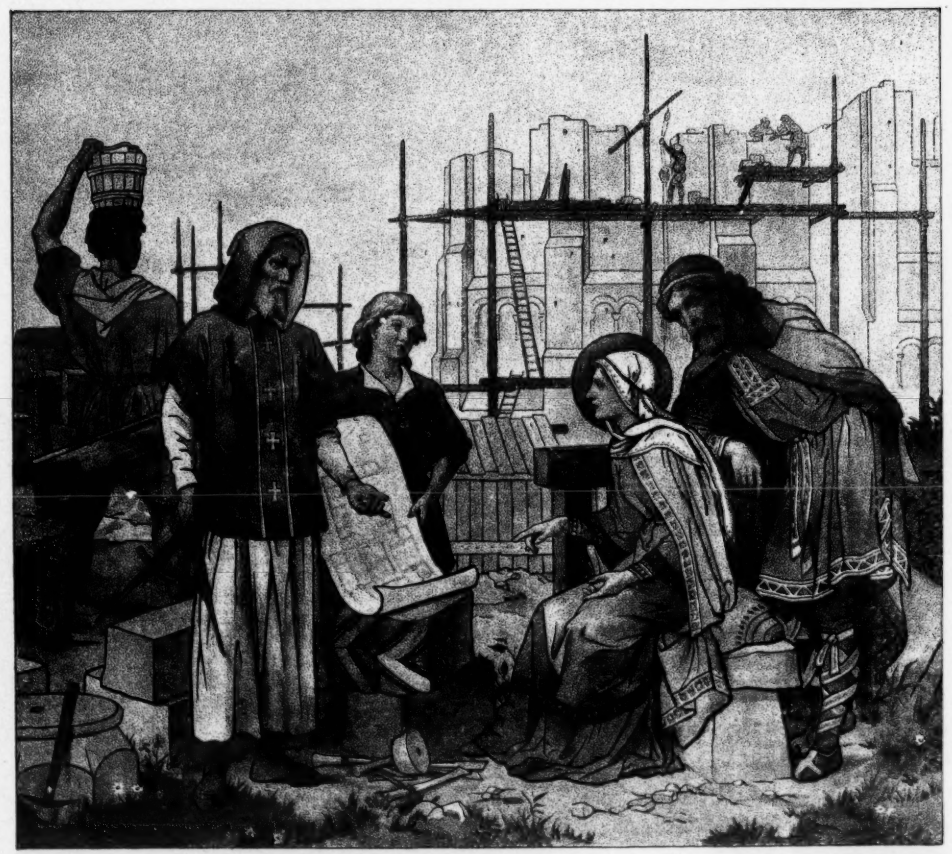
The only authentic account we have of her life is the above-mentioned memoir by Turgot, Prior of Durham, and later Bishop of St. Andrews, her contemporary and intimate friend, in which narrative "there is an atmosphere of calm, unexcited truthfulness, as well as an absence of the mythical, which commends it to us as the work of an eminent truth-loving man, and the incidental allusions to the current history bear the test of all that we know of the times." It is from this source that the various subjects have been selected.

The central portion of panel No. XI. is encroached upon by a piece of furniture, as indicated by the dotted lines.

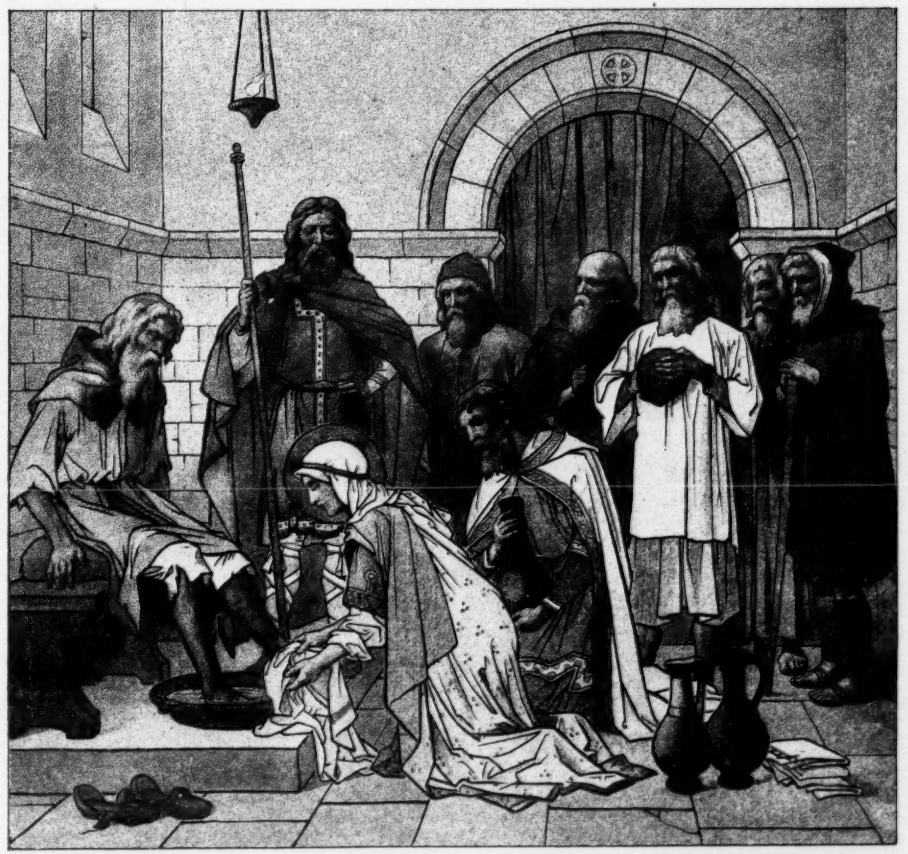
High School for Girls, Wolverhampton. A swimming entertainment was recently given in the new swimming-bath at The Larches (High School for Girls), Tettenhall-road. The Larches was purchased by Mr. J. Roper, Mus.Bac.Catab., a year or two ago, and as there was not enough accommodation for the large school conducted by Mrs. Roper, a new wing was designed and carried out by Mr. J. Lavender, architect, of Wolverhampton: this wing consists of a large dining-room, 30 ft. by 27 ft. 3 in.; cloak-room and lavatories, on the ground-floor; and a lofty school-room, 42 ft. 4 in. by 27 ft. 3 in. on the first floor. Subsequently the same architect has been entrusted with the work for the construction of a swimming-bath, the water being 60 ft. by 18 ft., and 5 ft. 6 in. and 3 ft. 6 in. deep at the ends respectively. The bath is lined and paved with white enamelled bricks. The water is supplied from a spring within the grounds.

Water Supply in Ireland.—The great drought of last summer has caused many Irish Boards of Guardians to decline trusting any longer to wells and pumps, and to take means for obtaining a constant supply. A good many engineers are therefore engaged in preparing plans for supplying, among other places, Carlow, Longford, Nevagh, Roscrea, and Athy with water. In the latter place an arrangement is adopted by which all the water will be filtered upwards, by which means, it is claimed that the water is better filtered and the filtering beds more easily cleaned.

III. MARRIAGE WITH KING MALCOLM. A.D. 1070.



IV. BUILDING OF DUNFERMLINE ABBEY.



V. LENTEN WORKS OF CHARITY.

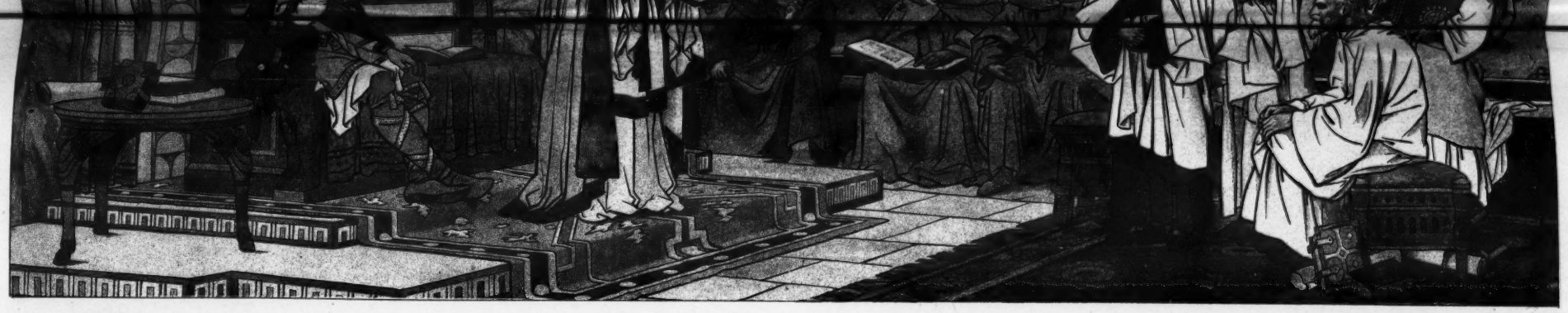
"INK-PHOTO", SPRAGUE & Cº. 22, MARTINS LANE, CANNON ST, LONDON, E.C.

LIFE OF ST. MARGARET, QUEEN OF SCOTLAND.

WALL PAINTINGS AT MOUNT STUART, ROTHESAY, FOR THE MARQUIS OF BUTE.—BY H. W. LONSDALE.

I. CHILDHOOD.

II. LANDING AT WEARMOUTH. A.D. 1068.



VII. CONTROVERSY WITH THE CULDEES.

IX. FEEDING POOR ORPHANS.

X. FINAL DEPARTURE OF MALCOLM.

"INK-PHOTO." SPRAGUE & Cº, 22, MARTINS LANE, CANNON ST, LONDON, E.C.

LIFE OF ST. MARGARET, QUEEN OF SCOTLAND.

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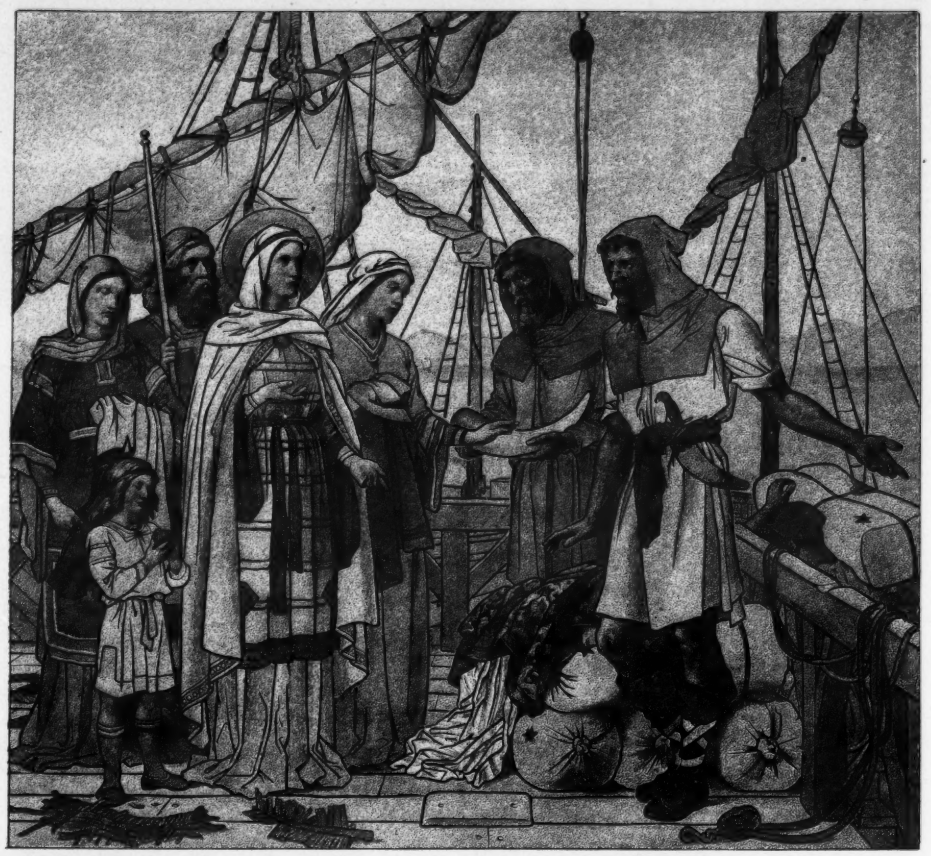
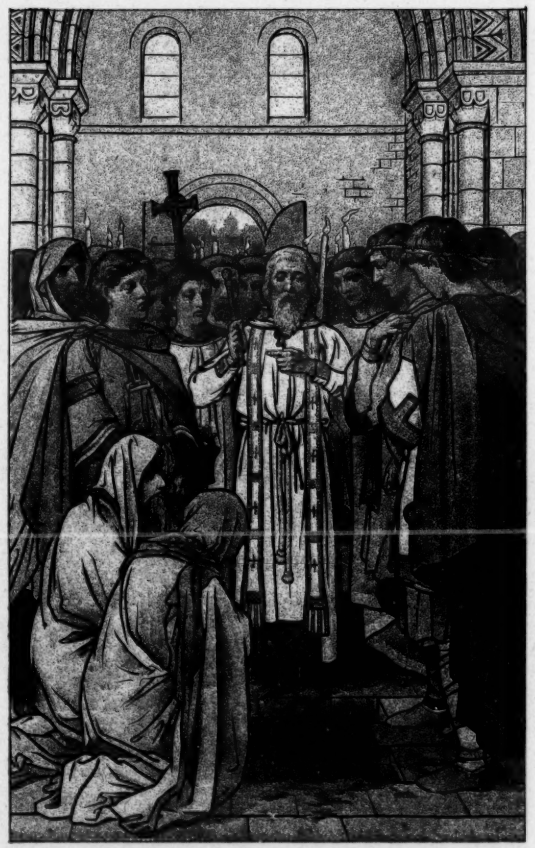


VI. PROMOTION OF FOREIGN COMMERCE.

VIII. EDUCATION OF HER CHILDREN.

XII. DEATH OF ST. MARGARET, NOV. 16, 1093.

XIII. WATCHING THE BIER.



XIV. BURIAL OF ST. MARGARET.

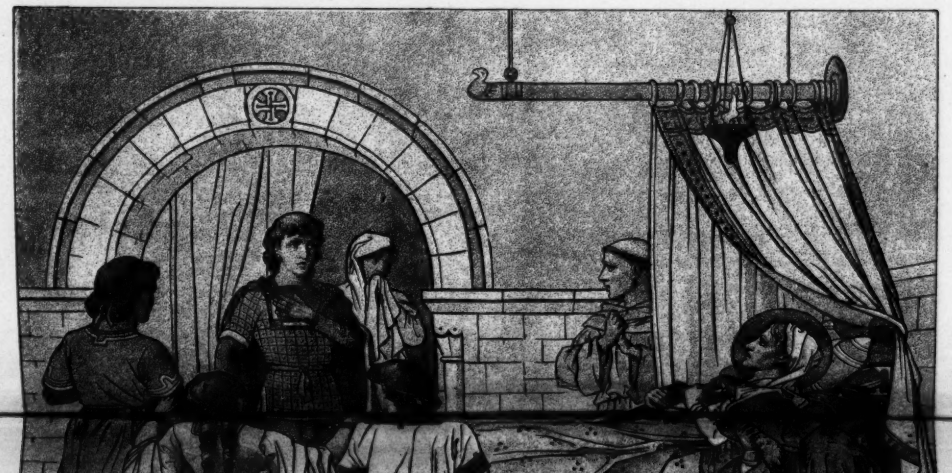
XV. TRANSLATION OF THE RELICS. A.D. 1250.

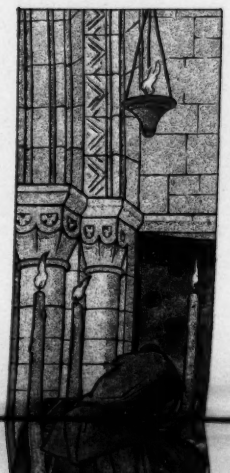
INK-PHOTO. SPRAGUE & Cº, 22, MARTINS LANE, CANNON ST, LONDON, E.C.

LIFE OF ST. MARGARET, QUEEN OF SCOTLAND.

WALL PAINTINGS AT MOUNT STUART, ROTHESAY, FOR THE MARQUIS OF BUTE.—BY H. W. LONSDALE.

DEATH OF KING MALCOLM, NOV. 13, 1093. XI. HIS ELDEST SON EDWARD MORTALLY WOUNDED.





THE "HEIM" SYSTEM OF HEATING.

SIR,—Deeply should I regret, in common with all your readers, to find the columns of your journal open to the contentions of rival manufacturers. But the present case is not of that kind. I have no reason to suppose that your correspondent, Mr. J. Russell Endean (pp. 264–5, April 14th) is in any way pecuniarily interested in Herr Heim's system of warming, and although I ventured to express a doubt as to its novelty and value in your journal (p. 209, April 21), I trust in a mild and reasonable spirit,—I simply looked upon Mr. J. Russell Endean's advocacy of it as that of a travelled member of the London School Board, who believed he had discovered a treasure, and "was conferring an actual benefit upon his fellow subjects, and discharging a duty neither useless nor unwise."

But the tone of Mr. J. Russell Endean's last letter (p. 306, April 25), in which he imputes to a firm of respectability "an attempt to disparage the 'Heim' system in their own interest," and ridicules my Hygiastic Grate, is calculated to raise a doubt as to his entire disinterestedness.

As a member of the London School Board, Mr. Endean had every opportunity of being assured of the preference awarded to my grate, both by the late and present Architects of the Board, and I believe I may add of the whole teaching staff, and was bound, as an honourable man, to hesitate to publish the monstrous statement that the caretaker of the school had to tell him that "he was never able to raise the temperature of the school more than 6° to 7°"; that "to make the room bearable it was necessary to keep the gas constantly burning"; and "the consumption of the grate 60 lb. of coal per day." Such sweeping statements carry their own refutation, and scarcely need my indignant denial and condemnation. They may, however, work for good, as it is my intention to offer to report to the Board certain suggestions for greater efficiency and economy in working the warming appliances of the school.

But to return to Herr Heim's stoves, which I have made it my business to see at the Board School, Summerford-street, Bland-street, Bethnal Green, E., the scene of Mr. Endean's experiments.

I am told that the stoves sent are upon trial; that an endeavour to warm the central area of the building,—covered in by a skylight of considerable size,—had been made by two close-stoves of another maker, and failed. That Herr Heim's first introduction was with the view of warming this cold space by two of his stoves. These are said to have been successful, doubtless by the great heat of their sheet-iron cases and flue pipes. Permission was next given to try similar stoves in two class-rooms, where the fireplace openings were temporarily boarded up. The two stoves were fixed, and strange, indeed, would it have been if such air-burning appliances had not speedily got up a heat too powerful to be endured. As to the "glowing coals," open to view, and the expressions of complete satisfaction by every person present, including the Board architect, I shall believe in them when I see and hear them.

Meanwhile, I would recommend all who feel interested to pay an early visit to the school and to see and judge for themselves. For their information, Bland-street is immediately opposite the London Hospital, in the Whitechapel-road, and Summerford-street a turning to the right out of it.

D. O. BOYD.

19, *Maddox-street, W.*, April 30th, 1888.

ENGLISH *v.* BELGIAN JOISTS.

SIR,—While I have no desire to assist in turning the controversy to which my letter in your number of the 3rd of March [p. 161, *ante*] on this subject has given rise into a mere personal matter, or a means of advertising manufacturers, be they good, bad, or indifferent, I think I may ask your indulgence to offer a few remarks in answer to your correspondents, Messrs. Gardner, Anderson, and Clarke, and "Acero." To my mind it is regrettable that "Acero" did not sign his real name instead of assuming a *nom de plume*, as then readers might have been able to give a proper value to his assertions, which they cannot otherwise consistently do, and he should have stated under what circumstances his tests were made; the circumstances have all to do with the results. There is a vast difference between selecting joists at random from ordinary stock, or from a general parcel fresh from the works not made to any specification, and from a parcel specially made to a specification, and yet not necessarily made for test purposes, as "Acero" states, the joists he tested were not.

I may say at once that I have nothing to alter, amend, or qualify in my former letter: it is as explicit as needs be, and truthful. I must, therefore, leave your readers to judge whether or not they will be justified in continuing or discontinuing the use of Belgian or English joists as the case may be; there are my thirty years of engineering experience, during twenty-three of which I have used Belgian and English joists of the value of 300,000*l.* on the one side, and "Acero's" four years' experience on the other side.

Now I have no prejudice whatever, and I am bound to use those joists which give me uniformly the best results, and they are at the present the Belgian; but as an Englishman I should be delighted if English joists could be made equal in every respect to the Belgian, and at the same price, for then an enormous impetus would be given to the iron trade, and work found for thousands of iron-workers now unhappily out of employment, or who have to turn their hands to other callings not at all congenial.

It is utter nonsense for people to say good iron cannot be obtained from Belgium. I am constantly having a quality equal to 22·3 tons per square inch tensile stress, under a specification which only asks for 22 tons. It is simply a question of paying a *fair price* for it, and *seeing that you get it*; but I am perfectly aware that there is always a large quantity in the market used by builders which is not equal to 16 or 18 tons per square inch tensile stress, and this vile rubbish is the result of builders being allowed to do pretty well as they like, and use the cheapest iron obtainable, irrespective of quality or any other consideration. If this is not so, then, I ask, how is it that such large quantities of the commonest joists are sold to the building trade?

I am at this moment using a considerable quantity of Belgian joists in several works, none of which are under 22 tons per square inch, and I am testing them quite indiscriminately, with the very best of results.

As against "Acero's" tests, I beg to submit the following, made upon Belgian joists taken at random from the ordinary stock of reputable makers, and from sections not made to any special specification, but for general sale:—

Results of Tests for Deflection, &c., of Three Rolled-Iron Joists. Load applied at Centre.

Description, Dimensions, and Weight.	Test No.	Span.	Stress in pounds. Deflection and Set in inches. 10,000	11,000	12,000	13,000	14,000	15,000	16,000	17,000	18,000	19,000	20,000	21,000	22,000	23,000	24,000	25,000	26,000	27,000	28,000	29,000	30,000	31,000	32,000	33,000	Stress. Elastic.	Stress. Ultimate.	Ratio of Elastic to Ultimate.	Remarks.
6′·00″ × 5·00″ × ·45″ 26·27 lb. per foot.	P. 5,072	— 10′·0″	·23 Set.	·26 —	·31 —	·34 —	·36 —	·40 ·00	·45 —	·48 —	·52 —	·56 —	·60 ·04	·64 —	·78 —	·91 —	1·12 —	1·69 0·91	2·05	2·58	3·54	·71	·80	4·68	5·86	7·14	8·85	11·51	21,900	33,350	65·3	Buckled.
7·2″ × 3·70″ × ·38″ 19·51 lb. per foot.	5,068	10′ 0″ —	·25 Set.	·29 —	·33 —	·37 —	·38 —	·43 ·02	·46 —	·49 —	·52 —	·58 —	·64 ·08	·72 —	·93 —	1·38 —	— —	— —	—	—	—	—	60,000	—	—	—	—	18,700	23,442	79·7	Bottom flange broke.
10·05″ × 5·0″ × ·47″ 35·69 lb. per foot.	5,076 —	10′·0″ —	·17 Set	·19 —	·21 —	·23 —	·25 —	·27 ·00	·29 —	·31 —	·34 —	·38 ·01	·40 —	·43 —	·46 —	·49 —	·49 —	·55 ·08	·59	·68	·71	·80	—	—	—	—	—	48,500	59,132	82·0	Snapped asunder.

Results of Tests for Tensile Strength, &c., of Three Rolled-Iron Joists.

Description.	Test Number of Joist under Bending Stress.	Test No.	Original Size.	Original Area.	Stress. Elastic, per square inch.	Stress. Ultimate, per square inch.	Ratio of Elastic to Ultimate.	Contraction of Area of Fracture.	Stress per square inch of Fractured area.	Extension set in 10 inches. At 40,000 lb. pr. sq. in.	Extension set in 10 inches. At 50,000 lb pr. sq. in.	Extension set in 10 inches. Ultimate.
			Inches.	Square inches.	lb. Tons.	lb. Tons.	Per cent.	Per cent.	lb.	Per cent.	Per cent.	Per cent.
Top flange	—	5,077	2·00 × ·61	1·22	34,500	48,760	70·7	7·2	52,596	1·27	—	6·1
Bottom do.	5,073	5,078	2·00 × ·61	1·22	39,700	46,245	85·8	2·1	47,251	0·23	—	0·8
Web	—	5,079	2·03 × ·35	0·900	38,800	55,643	69·7	7·3	60,043	0·31	2·91	8·2
				Mean.....	37,666 = 16·8	50,215 = 22·4	75·4	5·5	53,296	0·60	—	5·0
Top flange	—	5,069	1·50 × ·38	·570	36,400	52,360	69·4	17·7	63,658	1·14	6·71	9·4
Bottom do.	5,068	5,070	1·50 × ·39	·585	39,700	49,905	79·5	7·0	53,665	0·18	—	3·2
Web	—	5,071	1·50 × ·39	·570	37,300	44,860	83·1	7·1	48,336	0·89	—	2·7
				Mean.....	37,800 = 16·9	49,048 = 21·9	77·3	10·6	55,219	0·73	—	5·1
Top flange	—	5,073	2·00 × ·49	·980	37,800	42,485	88·9	2·5	43,592	0·39	—	0·8
Bottom do.	5,072	5,074	2·00 × ·49	·990	35,700	54,070	66·0	10·8	47,637	1·11	6·43	10·9
Web	—	5,075	2·00 × ·43	·860	30,400	43,815	69·3	6·5	46,865	3·21	—	5·4
				Mean.....	34,633 = 15·4	46,790 = 20·9	74·7	6·6	46,031	1·57	—	—

Now, using Mr. Kirkaldy's motto, these are "facts, not opinions," and the facts are that the mean ultimate tensile stress equals 21·7 tons per square inch; the highest is 22·4, and the lowest 20·9. Surely for ordinary rolled joists nothing more can be desired, and it proves beyond a doubt that the joists testedjby "Acero," giving a mean of 19.75 only (the highest being 20·6 and the lowest 18·9) was an inferior one, and the English joist, for which he claims so much, only gives a mean of 22·5, or but ·8 above my Belgian joist test.

I also give other tests made under exactly similar conditions, as follows:—

Results of Tensile Tests of Two Pieces of Joist Iron.

Test No.	Dimensions.			Limit of Elasticity.		Breaking Load.		Ratio of limit to break.	Extension of whole length 10 in.	Reduction of area at Fracture.	Work of Fracture in inch tons per cubic inch (calculated).	Remarks.
	Breadth.	Thickness.	Area.	Pounds per square in.	Tons per square in.	Pounds per square in.	Tons per square in.					
	Inches.	Inches.	Square in.						Per cent.			
136,251	1·495 (10″ × 5″ ×	0·452 $\frac{9}{16}$″ flange)	0·676	35,820	15·99	50,440	22·52	0·710	7·7	14·2	1·56	Silky laminated, about 5 per cent. crystalline.
136,252	1·498	0·517 (web)	0·775	35,640	15·91	52,060	23·24	0·685	12·5	15·5	2·60	Do. do.

The mean tensile stress equals 22·88 tons per square inch, which entirely beats "Acero's" record!

It is, therefore, quite impossible to deny the excellent quality of these joists, and their make and appearance are all that can be desired.

These tests were made prior to my letter of the 3rd of March, and consequently not for the purpose of replying to "Acero's" remarks. I maintain that if architects and engineers will only see that they get the proper kind of Belgian iron, or specify a reputable firm, this high result can be honestly obtained throughout any quantity.

With your permission, I will on a future occasion submit some tests of steel joists which are now being made, and then, so far as I am concerned, the correspondence will close, and I thank you for your giving space in your journal for this reply.

Archibald D. Dawnay, A.M. Inst. C.E.
London Bridge House, King William-st., E.C.,
April 30th, 1888.

"THE VENTILATION OF SEWERS."

Sir, — Mr. John Phillips commenced his article [p. 296, *ante*] quite accurately when he stated that "the complete sanitary ventilation of sewers has never yet been properly accomplished."

The desired object will most certainly not be attained by the adoption of Mr. Phillips's "suggestion."

The isolation of sewers by means of the water-trap is not new; I applied that method eight years ago, and have more recently isolated several miles of sewers in this district in the same manner.

The first experiment tried in Wimbledon was on a sewer passing up a hill with a steep gradient; the trap was placed at the junction of the sewer with the main outfall, and it was provided with a so-called air-inlet, brought to the surface and provided with an iron grating; at the end of the sewer a 6 in. pipe was carried above the roof of an adjacent building. So far, Mr. Phillips's plan was anticipated.

I thought at that time that the air would pass into the sewer at the "air inlet" and out at the top of the hill. A week had not elapsed before I found I was wrong; the direction of the air in the sewer was prevailing down the hill and out at the "inlet." I commenced observations and found the same thing was occurring in other sewers; when further traps were inserted, therefore, means were provided to admit of the gases coming down to escape at levels sufficiently high to prevent inconvenience.

I was satisfied that continuous experiments were necessary, and I commenced a series, the observations being made with regard to the direction of flow of the sewer air, its temperature with that of the sewage, and the external air. These have been carried on for some months, and will be continued for a sufficiently long period to enable me to throw some light upon the subject, when the results will be made public.

In the meantime I will merely say that Mr. Phillips's conclusions as to effect of temperature are entirely erroneous, so far as the Wimbledon sewers are concerned, and these do not differ from other sewers in any essential particulars, so far as I am aware.

W. Santo Crimp.
Wimbledon, April 30, 1888.

Sir,—In the article on the above subject which appeared in your last issue [p. 296], Mr. John Phillips, C.E., states that the "complete sanitary ventilation of sewers has never yet been properly accomplished."

I would wish to state a few facts as to what has come under my attention in connexion with this important subject, not with any idea of controverting Mr. Phillips's theory, but from a sense of fairness to the originator of a system of sewer ventilation tried with success in Tottenham.

In the early part of last year some of the ventilating manholes in the district gave considerable trouble, and complaints of the emission of noxious gases were numerous.

As a remedy, several upcast shafts were erected, but these in most cases proved ineffectual. Indeed, I have frequently noticed that the shaft acted as the inlet and the grating in the road as the outlet.

Eventually the system of sewer ventilation and deodorising of sewer gas, invented by Mr. R. Harris Reeves, was brought under the notice of the Local Board, and it was decided to obtain the assistance of that gentleman. After making careful observations into the requirements of the district, Mr. Reeves fitted his apparatus to the most offensive ventilators, with the result that, although the sewer air continued to be freely given off, it was quite innocuous, and complaints at once ceased, thus proving that by the introduction of this system the sanitary ventilation of sewers had been accomplished.

This question is so closely allied to the problem of the treatment of sewage that I might proceed to say without irrelevancy that Mr. Reeves does not stop at the ventilation of sewers and deodorising of sewer gas,—he goes a step further and prevents sewer gas being made; also chemically treats the sewage whilst in the sewers ready for precipitation and manipulation at the outfall.

I recently had an opportunity of visiting Frome, where this system is in operation. In that town there is no smell either at the ventilators or at the sewage works.

The latter was locally known as the "Stinkeries," but now that term is in no way applicable.

C. J. Easton,
Chief Inspector, Sanitary Dept.,
Tottenham Local Board of Health.
May 2nd, 1888.

Stained-Glass Painting.—A lecture was given before the Society for the Encouragement of the Fine Arts, on Thursday, the 26th ult., by Mr. Phillip H. Newman, on "The Permanence of Modern Stained Glass Painting,"—Mr. G. A. Storey, A.R.A., in the chair. The lecture embodied a reply to the recent statements and deductions of Canon Lonsdale, in reference to the decay observable in modern memorial windows. Although this subject has been thoroughly threshed out years ago, Professor Barff and the late Clement Heaton contributing not a little to making durability in glass-painting much more of a certainty than had been the case in the early days of the revival, yet recent practice seems to have shown (by Canon Lonsdale's letter to the *Times*) some amount of carelessness as to use of proper pigment in painting, and also in the firing of the glass. Mr. Newman's research enabled him to prove in his lecture that, while the Canon's facts as to failure were indisputable, and even more extensive than dreamt of, the deductions from this that the art was in any way lost was utterly untenable and erroneous, showing beyond question that, with careful firing and the use of a properly silicated flux, the stained glass of to-day can be produced as lasting as at any period of the fourteenth and fifteenth centuries, artists using such care and pigments having nothing to fear as to the perishing of their work. Specimens were shown of glass painted with various pigments and submitted to the hydrochloric acid and other tests, the hard and duly silicated flux channels resisting these tests in all cases. Mr. Newman, at the close of his lecture, commented severely but justly on the reckless competition in regard to memorial and other windows as prejudicial in the highest degree to the art, pointing out that any decline apparent was due in great degree to the employment of irresponsible manufacturers rather than of qualified artists.

The Student's Column.

IRON.

XVIII.—MOVING LOADS.

THE diagram in our last article represents the shearing stresses in the web, as they increase with the gradual advance of the live load, and the ordinates measure the amount of stress at any point in the girder to which the load has advanced, in proceeding from the right to the left abutment. Immediately the load has passed any point, the stress at that point becomes altered, and as the load may advance from left to right, as well as from right to left, it will be necessary also to draw another parabola with its vertex at the left abutment overlapping the parabola with its vertex at the right abutment. The diagram will then be as in fig. 1, with a pair of identical parabolas, having their vertices at A and B, and their vertical ordinates at the opposite abutment equal to half the distributed live load. The ordinates, as shown in the figure, will then measure the maximum live load stresses in the web at any point.

When it is desired to obtain the total maximum stresses caused by the live and dead loads, it is only necessary to combine the diagrams shown in fig. 2. Thus by drawing the diagram for the dead load, above the diagram for the live load, the total shearing stresses produced by the combined loads can then be measured off by scaling the ordinates in the figure.

FIG 1

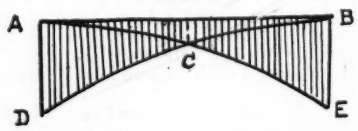


FIG 2

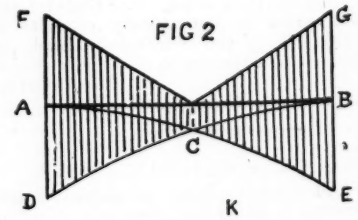
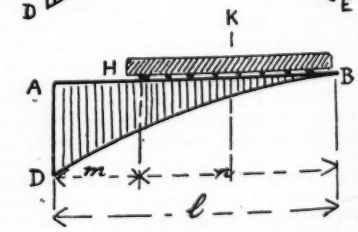


FIG 3



The maximum stresses caused by the live load may also be arrived at mathematically in the following manner, instead of by the graphic method indicated in fig. 1.

Suppose l = the span of the girder,

w = the load per unit of length,

m and n, the lengths of the left and right hand segments into which the girder is divided by the front of the load A H, when the load has advanced from B to H, and covers the whole segment H B.

R = reaction of the unloaded abutment.

Now it is evident that the shearing stress at H_1 will equal the portion of the load transmitted to the abutment A (fig. 3), and is therefore equal to the reaction R of that abutment. The load between H and B_1 may be assumed to be collected at its centre of gravity K, whose

distance from the abutment B will equal $\frac{1}{2}n$. Taking moments round the abutment B we obtain $R \times l = w\,n \times \frac{n}{2}$.

Therefore $R = \frac{w\,n^2}{2\,l}$ = the shearing stress at H_1, which amount is communicated throughout the unloaded segment.

When the load just covers one half of the span, $n = \frac{l}{2}$ and $\frac{w\,n^2}{2\,l} = \frac{w\,l^2}{4 \times 2\,l}$ or $\frac{w\,l}{8}$; *i.e.*, the shearing stress in the centre of the girder, when the live load covers one-half of the span, is one-eighth of the amount of the live load distributed all over the bridge.

A consideration of the above circumstances shows that the stress in the unloaded segment increases as the load advances, and can be easily determined by supposing the point H_1 to be moved to any other section where the stress is required.

*** We have received a letter from a correspondent calling our attention to fig. 3, p. 253, and its description in article xiv. It is evident that the downward reaction at A, produced by the fixing of the girder in the left abutment, causes bending moments in the girder which may be graphically represented by the triangle A G B. Similarly the downward re-action at B, produced by the fixing of the girder in the right abutment, causes bending moments in the girder which may be graphically represented by the triangle B H A. As the girder is fixed at both ends, we may, in order to avoid the overlapping of the triangles A G B and A H B, substitute the triangle A G H for the triangle A G B, then the vertical ordinates in the rectangle

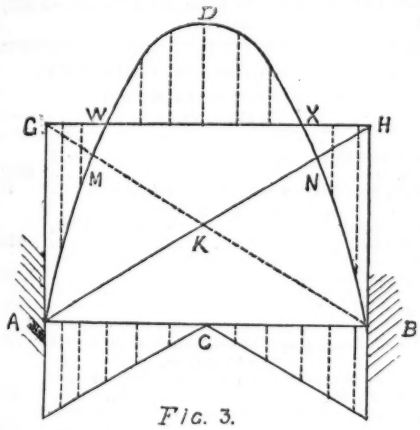


Fig. 3.

A G H B, will equal the sum of the vertical ordinates in the two triangles A G B and A H B, and will give the amounts of negative stress. The amounts of positive stress are represented by the vertical ordinates to the parabola A W D X B, and the points W and X, where the straight line G H intersects the parabolic curve, are the points of contra-flexure. Consequently the bending moment in the centre of the girder when fixed at the ends = D C − H B − 450 − 300 = 150 foot tons, and thus the girder is seen to be strongest in the centre; but since the girder is assumed to be of uniform section and the bending moment over the supports = 300 foot tons, as stated in the article (p. 253), the load of 90 tons would be the correct distributed weight to work upon, to give the same bending moment as 60 tons would give if the girder were unfixed at both ends. As, however, the ordinates shown by dotted lines are incorrectly represented upon p. 253, we thank our correspondent for his communication, and desire our readers to substitute the accompanying diagram. Mathematically the bending moment at any point X, from the left abutment may be found by the formula,

$$M_x = \frac{w\,x}{2}\left(l - x\right) - M_A + \frac{x}{l}\left(M_A - M_B\right)$$

in which M_A and M_B represent the bending moments at the abutments A and B respectively and l = the length of clear span. Where M_A is equal to M_B as in the diagram the last factor in the equation vanishes, and

$$M_x = \frac{w\,x}{2}\left(l - x\right) - M_A$$

or if $x = \frac{l}{2}$ then

$$M_x = \left(\frac{w\,l}{4} \times \frac{l}{2}\right) - \frac{w\,l^2}{12} = \frac{w\,l^2}{24}$$

Books.

A Short History of Architecture. By ARTHUR LYMAN TUCKERMAN. With Illustrations by the Author. (London: Bickers & Son. 1887.)

IT is a little difficult at first to determine whether this book is the work of an architect or of an amateur. The illustrations certainly suggest the former, the drawing showing a type of "Romanesque construction," for instance, having a marked professional flavour. But a perusal of the text does not bear out this view, and the author takes credit for both text and illustrations.

The following paragraph, *e.g.*, scarcely suggests a professional touch:—

"In Venice a peculiar development was attained, adapted to the flat elevations of the canal palaces. This arrangement consisted of a consecutive series of arcades, in which the mouldings of each arch were carried up and returned, forming a second and sometimes a third row of lights, replacing in the play of light and shadow the forced absence of projections."

Nor would an architect describe the prevailing verticality of line in Gothic art as a "sin." Some one, unhappily, said: "If you want to get up a subject, write a book about it," and but too many have, we fear, followed his advice.

We doubt whether books such as this, which now-a-days issue in growing numbers from the press, do any good to anybody. They are mere conglomerates of the often ill-understood opinions and dicta of authorities such as Ruskin, Fergusson, Viollet-le-Duc, and others. To the serious student such books are almost valueless, and the outsider who wants to know something of architecture and is willing to be at the necessary pains had much better go to accredited sources of information and get his facts at first hand.

Strains in Structures. An Elementary Treatise by N. A. MOOS, F.R.S.E. London: Griffith, Farren, Okeden, & Walsh, St. Paul's Churchyard.

THIS book contains the substance of sixteen lectures delivered to the senior students of the College of Science, Poona, and deals with the strength of materials and the stresses in girder constructions. Some notes upon the suspension-bridge principle, and also upon roof trusses and retaining walls, form a valuable addition to the book. The author's definitions are generally clear, but he gets a little confused in his description of girder types: thus, upon page 29 we read "a girder with a single system of triangle is called a Warren girder; when with two or more *right-angled* triangles, a lattice girder," and then upon page 43 "Warren girders or girders with equilateral bracings."

In his general remarks the author points out that punching as compared to drilling greatly reduces the strength of plates; that annealing bars after they are drilled restores to a great extent the strength lost by the process (page 8); still, that annealing tends to reduce tensile strength, though it renders the iron more ductile and tough; and that removing the skin of wrought iron does not injure the tensile strength (page 7); also that remelting cast-iron within certain limits increases the tensile strength, and that the best results to get good cast-iron are arrived at by making a mixture of a number of different cast-irons all carefully selected.

The author's explanation of the principle of work done by fixed and moved loads in a structure is useful. His treatment of the stresses in girders is admirable, and his diagrams are practical and clear. Shearing stress is not always so well explained in other books as a flange stress or a bending moment is, but the author here shows that it is a vertical force transmitted through a section of the girder, and, therefore, in braced structures it would be the vertical component of the diagonal stresses; also, that when the flanges are not parallel and horizontal, the web has less duty to perform than when the flanges are parallel, and that in braced girders the shearing stress at any point as transmitted through the braces is greater than in girders with continuous webs,—the increment depending directly upon the angle of inclination given to the braces. We are glad to see attention drawn to the value of a contraction of area test in estimating the quality of iron. A practical set of ninety-three examples for solution are added at the end of the book.

Text-Book of Practical Geometry, Solid, Plane, and Arithmetical. By W. E. CROWTHER. London and Manchester: John Heywood.

IN this handy elementary text-book the author reverses the usual order of instruction, and deals, in the first place, with Solid Geometry. He argues that students, proceeding as they do with the same instruments in both plane and solid geometry, are apt to regard the mathematical effort involved in the study of plane geometry as too continuous, and hence they fail to understand that a fresh and entirely different faculty of the mind has to be brought into use when studying solid geometry.

The work is intended as a text-book for artisans engaged in constructive handicrafts, students in science classes, mechanical and architectural draughtsmen, and others. It is clearly explained that in an elevation drawing you are supposed to be looking horizontally at every point of the object represented, whereas in a plan you are looking vertically at every point of the object shown, the eye of the observer being in each case considered to be placed at the same distance from any single elevation or plan that is being viewed. For sake of demonstration the author has adopted the plan of shading several of the earlier diagrams which illustrate a plan. There are 109 pages containing examples, followed by problems to be worked out, which is an excellent way of teaching. The construction of scales is very properly stated to be, a special test for accuracy and neat draughtsmanship.

In the Appendix some excellent advice is given to students on solving problems, after which follow a series of exercises and examination papers, concluding with a summary of terms employed both in solid and plane geometry as explained in the book.

Quantities, &c. By BANISTER FLETCHER, F.R.I.B.A. Fifth edition, revised. London: B. T. Batsford. 1888.

THIS work has reached its fifth edition, and, carefully revised throughout, is now, its author believes, "as perfect as such a work can be." Perhaps so. It is, we suppose, impossible to frame a text-book on such a subject which shall include everything and omit nothing, and be everywhere up to date. It is, no doubt, the best work on the subject extant, but it is still not improbable that in the sixth edition the author may find room for a few "extras and omissions." *E.g.*, some of the author's professional brethren may think that the admissions on p. 176, on the "weighting" of quantities by way of insuring, at the employer's expense, against the liability of the surveyor, might be suppressed. The obsolete lead D-trap need no longer figure in such a book, and the remarkable cornice on p. 45, is not altogether worthy of an F.R.I.B.A.

The "usual" payment for quantities is set down at 2½ per cent., and on p. 149 it appears that the author received that percentage on some very straightforward work of which he was also the architect. But it also appears on p. 176 that 2 per cent. only was paid in another case, and it is, of course, very well known that 2½ per cent. is an exceptional and not the normal rate.

These few remarks show that there may still be found by a careful editor a few matters for further improvement of this very useful work, and it is plain to all that the "illustrations" generally are not quite representative of the architecture of the day.

Rules and Regulations affecting Building Operations in the Metropolitan Area. Compiled by ELLIS MARSLAND, District Surveyor for East Kensington. Published at the East Kensington District Office.

THIS is a small duodecimo book, containing the building clauses from the Metropolitan Building Acts, the Metropolitan Local Management Acts, and the City of London Sewers Acts; with the by-laws and regulations made by the Metropolitan Board of Works, the Commissioners of Sewers, the Local Vestries and District Boards, and the Water Companies. The book is of a conveniently small size, and will, no doubt, be useful as a book of reference. The names and addresses of District Surveyors, with the boundaries of their districts, are scheduled.

Marble and Marble Workers: a Handbook for Architects, Artists, Masons, and Students. By ARTHUR LEE. London: Crosby Lockwood & Co. 1888.

Marble Decoration, and the Terminology of British and Foreign Marbles: a Handbook for Students. With 28 illustrations. By GEORGE H. BLAGROVE. London: Crosby Lockwood & Co. 1888.

THESE two books on the same subject are good types of their respective classes. The former is the work of a man who has a personal acquaintance with his subject in all its bearings and ramifications, and the latter is the work of an intelligent and painstaking compiler. One book is, in short, written, and the other made; and each contains something useful not found in the other. In both the indexes to the almost infinite list of available marbles are of unusual length, although neither is quite complete.

Mr. Lee brings out clearly the mischievous system of railway rates from which the home marble trade has suffered, and is suffering; inasmuch as French and Belgian marbles can be economically imported, while vast stores of British marbles of equal beauty and quality lie under our feet. It is time that serious efforts were made to redress this grievance, which in one form or another afflicts all British industry. The use of marble for interior decoration,—for which position alone it is suitable in our climate,—is growing daily; and the employment of machinery for cutting and polishing it has reduced its cost within practical limits. The architect is in want of handbooks on the subject: the two little treatises under notice have appeared opportunely, and will repay perusal.

The Life and Work of Joseph Firbank, J.P., D.L., Railway Contractor. By FREDERICK MCDERMOTT, Barrister-at-Law. London: Longmans, Green, & Co. 1887.

FROM the portrait at the opening of this book, and the appendix at its close, we learn almost all that is to be learnt from it about its subject. The former shows us a man of keen intelligence and strong will: the latter gives a list of works carried out by him during forty years of a long and prosperous career. It is true that the name Firbank flits like a phantom through its pages; but of the man himself we see but little. He is simply scheduled, like his works. Born in 1819; died in 1886; at seven put to work in a mine; mastered by stealth the three R's; obtained a sub-contract for the Woodhead tunnel in 1841; and in the end carried out more lines single-handed than any other contractor. He appears to have been trustworthy and trusted, "true and just in all his dealings," and courageous and resourceful in the face of difficulties. He went early to bed and rose early, and smoked an evening pipe, and was fond of farming. *Voilà tout;* a bare outline indeed!

The bulk of this book of 144 pp. is taken up with abridged accounts of Mr. Firbank's various undertakings, interspersed with tables of the comparative lengths of tunnels and the altitudes of lines of railway. We thank the author for the accredited anecdote of the contractor who estimated a work at 18,000*l.*, increased it to 20,000*l.* on the recommendation of his wife, doubled that figure to make *sure*, and, having slept upon it, doubled that again to be on the *safe* side. His tender of 80,000*l.* was the *lowest*. He got the work and founded a fortune. We should think so indeed!

We cannot help expressing our disappointment at a book which, dealing with so substantial and interesting a personality as the late Joseph Firbank, presents us with such a "pale abstraction" as this. Biography is an art in which few excel, and we fear Mr. McDermott is not amongst the few.

The Standard Timber Measurer, &c. By E. A. P. BURT, Chief Measurer at the Surrey Commercial Docks. London: Wm. Rider & Son, *Timber Trades Journal* Office. 1888.

THE author of this treatise is the inventor of a slide cubing rule, known as the "Standard Slide Rule," and the book is avowedly a key to the use of the rule. Timber of all shapes and sizes presenting any difficulty in its cubic measurement, is taken by way of example, and the working of the cube by the ordinary or "pen" process, and by the application of the sliding rule, is in each case shown in detail, A large portion of the book is devoted to tables of cubic measure from given scantlings, and will be useful as a ready reckoner for the timber measurer. There is an interesting table of "scribe marks," used for marking the contents of timber logs; and a table of breaking strains (? weights) of various English and foreign timber. The treatise is indeed "practical," as its title claims, and one wonders how so apparently simple an affair as the cubing of timber can fill over 300 pages without some redundancies, which in this work we confess we are unable to detect. No timber measurer, however attached to his "Hoppus," can afford to be without Mr. E. A. P. Burt's "standard" rule and treatise.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

4,204, Joiners' Cramp. W. Hayhust.

The class of cramps to which the improvement which is the subject of this invention applies are generally made of flat iron, with a bracket fast at one end, in which there is a screw. Another loose bracket or shore slides along the bar; this can be fixed at any point. The screw is then tightened, and the work cramped up. The improvement consists in securing this loose bracket by means of a small pin and spring fixed inside it. A small wedge-shaped pin is forced downward by the spring and catches after the manner of a ratchet-rack in indentations of the bar of the cramp.

4,421, Fire Grates. E. Dunmer.

The sides and back of the grate or stove are, according to this invention, packed with asbestos, and then the fire slabs are fixed in their places. A larger amount of radiated heat and greater durability of the stove is the object for which the packing with fire-resisting material is devised.

6,137, Fire Grates or Stoves. S. Pickersgill.

Double flue doors are, by this invention, arranged to open separately or combined for the purpose of throwing the heat into the room, and the front bars are made to slide in and out of their standards.

6,573, Preventing the Escape of Noxious Gases from Drains and Sewers, and Ventilating them. J. Kiell and W. Garland.

According to this invention, a gully chamber with its upper part open to the atmosphere, having a vertical diaphragm or partition reaching nearly to its bottom, forms a syphon trap. One side of this trap communicates with the atmosphere, and the other side leads into a ventilating-pipe, its axis being at the highest part of its perimeter. It is arranged to close automatically by its own weight, and thus prevent any reflux or escape of sewer or other noxious gases from the drain or sewer; but when the pressure in the drain or sewer and ventilating-pipe is less than that of the atmosphere outside, the vertical hinged valve is automatically opened inwards, and permits the free admission of pure air to the drain or sewer pipes. By this means the noxious gases are displaced and the atmosphere therein purified. The hinged valve is preferably made of glass, talc, or other incorrodible material.

7,411, Cements for Building. A. Busch.

Instead of using magnesium usta (Mg.O.), which is expensive, dolomite, heated and ground with slag, is used by the inventor.

15,118, Window Sashes. G. Weeks.

The sashes, which are the subject of this patent, are balanced by means of pulley-wheels and cords, so that by lengthening or shortening the cords or chains the sashes may be opened either separately or both together. The sashes are fitted with a frame complete, and then fitting the said frame with centre-pins perpendicularly, and by combining a pivot movement with a balance movement, the window may be reversed for cleaning.

NEW APPLICATIONS FOR PATENTS.

April 20.—5,916, A. Macmurdo, Warming Apartments.

April 21.—5,929, S. Eddington and J. Stevenson, Brick Moulding Machines.—5,931, D. Hory, Ventilating Halls, Rooms, &c.—5,955, W. Kellaway, Fixed Stoves or Grates.—5,969, H. Barfoot, Chimney-pots.—5,975, E. Berliner, Heat Radiating Mantel for Fireplaces.

April 23.—6,001, H. Stockman, Drain-pipes.—6,023, J. Trinick, Locking Sashes when Closed or Open for Ventilation.—6,039, I. Dando, Ventilators.

April 24.—6,103, C. Brothers, Hit-and-Miss Ventilators.

April 25.—6,139, J. Petter, Roof-plates for Stove-pipes.—6,140, J. Bannochie, Open Fire-grates.—6,142, J. Hamblin, Fireplaces.—6,143, E. Davies, Galvanised Cisterns and Tanks.

April 26.—6,174, T. Hughes, Sliding Gas Chandeliers, &c. — 6,190, G. Kyle, Syphon Water-waste Preventing Flushing Tank.—6,200, W. Macfarlane, Baths, Cisterns, &c.—6,203, A. Margetson and W. Hek, Tip Carts, Wagons, and Vans.—6,207, G. Arnold, Joint Connexions of Sanitary Drain-pipes, &c.—6,211, L. Witthoffit, Circular Saws or Sawing Machinery.—6,222, W. Palmer, Eaves Gutters.—6,223, J. Whistler, Suspending Velarium, Panoply, or other Canopied Draperies from Ceilings, Roofs, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

14,976, R. Quine, Supplying Hot-air to Rooms in connexion with Stoves or Grates.—1,997, E. Dupont, Construction of Walls and other Partitions, Roofs, &c.—3,249, W. Stokes, Gully Traps.—3,419, G. Brown, Kilns for Bricks, &c.—3,708, R. Lee, Fire-proof Ceilings, Walls, Partitions, Buildings, &c.—3,772, J. Barclay, Traps and Spigot and Faucet Drain-pipes.—3,856, T. James and H. Brookes, Window-sashes.—3,888, A. Boult, Door Hinges.—3,924, J. Jones, Portable Buildings, &c.—4,182, R. Harrison, Opening, Closing, and Adjusting Fanlights, Sashes, &c.—4,200, A. Demetrius and E. Sargeant, Automatic Draught Excluder.—4,335, J. Brooke, Apparatus for the Admission of Fresh Air into Buildings.—4,367, O. Elphick, Water-waste Preventers.—4,493, J. and A. Sizer, Chimney Cowls and Ventilators.—4,525, F. Parker, Endless Band-saw Machines for Sawing or Cutting Timber, Stone, &c.—4,551, R. Haddan, Saw Setting and Sharpening Machines.—4,581, P. Ayton, Casement and other Stays.—4,672, J. Troop, Ventilator.—4,773, W. White, Tiles and Fixing same to Ceilings, Wooden Partitions, Walls, &c.—5,107, W. Nunn, Water-waste Preventers for Water-closets, &c.—5,142, A. Henderson, Flushing Closet-pans.—5,165, D. Burns, Chimney-cowls.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

6,256, W. Kneen, Door Latches, &c.—6,820, W. Gwinett, Eaves-plate with or without Gutter, for use with Corrugated Roof and Wall Coverings.—7,036, F. Trier, Stone-working Machines. — 8,361, H. Belcher, Brick-pressing Machine.—8,657, J. Wilson, Planing Wood. — 8,660, E. Verity and Others, Attaching Combined Springs and Air-checks to Doors, &c.—8,810, W. Wise, Flooring.—8,849, S. Bastow, Door Cramp.—11,937, J. Homan, Fireproof Floors.—326, M. Blanchard, Terra-cotta Fireproof Construction.—3,761, C. Cook, Sash-holder.—5,333, T. Lodge, Portland Cement.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

APRIL 23.

By MURRELL & SCORELL.

Hornsey—139, Lothair-road, 89 years, ground-rent 6*l.* 6s.	£250
Roxeth, near Harrow—A plot of freehold land	40

By HORNE, SON, & EVERSFIELD.

Manchester-square—7, Bentinck-street and stabling, 21 years, ground-rent 60*l.*	820
Marylebone-lane—Nos. 64 and 66, term 35½ years, ground-rent 80*l.*	1,600
Clapham—16, Mayflower-road, 94 years, ground-rent 10*l.*	380

By DOWSETT & Co.

Woldingham—A plot of freehold land, about 3 acres	200

By F. HARDS.

Clapham—36, Courland-grove, 74 years, ground-rent 5*l.* 10s.	260
1, 2, and 3, Merston-cottages, 74 years, ground-rent 12*l.*	455
West Dulwich—24 and 26, Chancellor-road, freehold	540
Poplar—5, Union-street, freehold	240
Bromley, Kent—21 and 22, Farwig-lane, freehold	265
Croydon—7 and 8, West-street, freehold	530

APRIL 24.

By BROAD & WILTSHIRE.

Notting-hill—39, Arundel-gardens, freehold	1,410

By DEBENHAM, TEWSON, & Co.

Goswell-road—Ground-rent of 412*l.*, reversion in 77 years	10,900
Nos. 3 and 5, Goswell-road, freehold	3,600
Canonbury — 10, Northampton Park, 38 years, ground-rent 6*l.*	590
Gower-street, No. 68—The lease of, term 28 years.	1,030

By A. RICHARDS.

Palmer's Green—Stonard Villa, freehold	450
Tottenham—1 and 2, Sherwood-villas, 62 years, ground-rent 13*l.* 7s.	350

By A. WATSON.

Lavender-hill—73 and 75, Beaufoy-road, 81 years, ground-rent 10*l.*	395
Edmonton—Ground-rent of 20*l.*, reversion in 79 years	405

By BLAKE, HADDOCK, & CARPENTER.

Reigate—Freehold land, 4a. 3r. 10p.	1,500
Two freehold houses in Chart-road	910
A plot of freehold land	225
Anerley—12, Station-road, 86 years, ground-rent 12*l.* 12s.	515
Redhill, Earlsbrook-road—Two plots of freehold land, 3a. 2r. 10p.	1,580
Sydenham-road—The White Horse Inn, freehold	1,770
Croydon—84 and 85, Gloucester-road, freehold	243
Furze-road—Two freehold houses	423
The freehold house and stable adjoining	258

APRIL 25.

By BEAL, SON, & CHARTRES.

Commercial-road—Ground-rent of 4*l.* 4s., reversion in 37 years	97

By FULLER, HORSEY, SON, & CASSELL.

Notting-hill—27, Colville-gardens, 73 years, ground-rent 16*l.*	650

By BALL, NORRIS, & HADLEY.

Maidenhead—The Bungalow, and 7½ acres, freehold	3,000

By F. J. BISLEY.

Rotherhithe—78, Albion-street, 64 years, ground-rent 2*l.* 12s. 6d.	300
5 and 6, Berkeley-street, 67 years, ground-rent 4*l.* 5s.	465
606, Rotherhithe-street, freehold	72

By SEDGWICK, SON, & WEALL (at Berkhampsted).

Berkhampsted—The Red Lion Inn, freehold	£800
King's-road—A plot of land, about 1 acre, freehold	720

APRIL 26.

By Mr. HAWKINGS.

Forest-hill—1 and 2, Royal Oak-villas; and 1 to 15, Loyal Oak-place, 68 years, ground-rent 45*l.*	1,950

By M. MILES.

Walworth-road—A plot of land, with licence attached, 80 years, ground-rent 50*l.*	2,800

By D. WATNEY & SONS.

Lambeth—11 to 16, Edward-street, freehold	4,340
Wandsworth—29 and 31, Spencer-street, freehold	1,420
8 to 14, Prospect-cottages, freehold	1,720
Surbiton, Alpha-road—Ground-rents of 25*l.* 10s., reversion in 76 years	640
Alpha-road—Ground-rents of 1*l.* 10s., reversion in 76 years	75
Smith-street—Ground-rents of 19*l.*, reversion in 76 years	415
James-street—Ground-rents of 24*l.*, reversion in 76 years	555

By C. C. & T. MOORE.

Bethnal-green—252 to 256 even, Globe-road, freshold	2,305
247 and 249, Globe-road, 56 years, ground-rent 4*l.*	510
Hackney-road—No. 198, term 45 years, ground-rent 10*l.*	300
Romford-road—33, Carlton-road, 89 years, ground-rent 3*l.* 16s.	185
Wapping High-street—Three plots of freehold land, area 10,077 ft.	1,730

By NEWBON & HARDING.

Commercial-road East—No. 120, freehold	550
Holloway—2, Upper Tollington-road, 54 years, ground-rent 6*l.* 10s.	405
Hackney—9, Pembroke-terrace, 83 years, ground-rent 6*l.* 6s.	220
8, The Broadway, 42 years, ground-rent 3*l.*	665
22, The Broadway, 14 years, ground-rent 35*l.*	130
Hackney-road — 123, Boston-street, 20 years, ground-rent 1*l.*	135
26 and 28, Maidstone-street, and a Ground-rent of 4*l.*, 21 years, ground-rent 6*l.* 4s.	150

By E. STIMSON.

Old Kent-road—19, Elcot-avenue, 92 years, ground-rent 6*l.*	215
Peckham—180, Meeting House-lane, freehold	300
99 and 101, Bellendon-road, 79 years, ground-rent 10*l.*	350
Newington-butts—7, Albert-street, and Ground-rents of 9*l.*, term 54 years, ground-rent 14*l.*	395

APRIL 27.

By A. & A. FIELD.

Hackney—1, 2, and 3, Cross-street, 67 years, ground-rent 10*l.* 10s.	555

By NASH & SON.

Ash, Ash-street—A plot of land, 4a. 3r. 37p., copyhold	360

By BAKER & SONS.

Erith—Freehold marsh land, 43a. 1r. 39p.	1,200
Essex, near Stanford Station—Two enclosures of freehold land, 36a. 0r. 24p.	435

By MARSH, EDWARDS, & Co.

Brixton—42, Poplar Walk-road, leasehold	272
New Barnet, Station-road—The Woodlands, freehold	600

By PRICKETT, VENABLES, & Co.

Wandsworth—67 to 81 odd, South-street; and Ground-rents of 6*l.* a year, 14 years, ground-rent 20*l.*	540
Finchley—Ground-rents of 15*l.*, reversion in 53 years	365
Ground-rents of 28*l.* a year, reversion in 53 years	830
Detached freehold cottage and large garden	615

Erratum.—The Lodge, and 15a. 3r. 6p., reported in the *Builder* for the 28th ult. as sold for 8,200*l.* realised 8,100*l.*

MEETINGS.

SATURDAY, MAY 5.

Architectural Association.—Visit to Beaumont College. (See advt. on first page of the issue for April 28).

Association of Public Sanitary Inspectors.—Annual Address of the President, Mr. Edwin Chadwick, C.B. 6 p.m.

St. Paul's Ecclesiological Society.—Visit to Westminster Abbey. 3·45 p.m.

Edinburgh Architectural Association.—Visit to Elie, Elie House, and Kellie Castle, St. Monance Church, and Old Castle near.

MONDAY, MAY 7.

Royal Institute of British Architects.—Annual General Meeting. 8 p.m.

Society of Arts (Cantor Lectures).—Mr. G. Aitchison, A.R.A., on "Decoration." II. 8 p.m.

Society of Engineers.—Mr. E. Perrett on "Filtration by Machinery." 7·30 p.m.

Clerks of Works' Association (Carpenters' Hall, London-wall).—Monthly Meeting. 8 p.m.

Royal Institution.—General Monthly Meeting. 5 p.m.

TUESDAY, MAY 8.

Society of Arts (Applied Art Section).—Mr. J. D. Crace, on "The Decorative Use of Colour." 8 p.m.

Institution of Civil Engineers.—(1) Further Discussion on Mr. E. B. Ellington's paper on "The Distribution of Hydraulic Power in London." (2) Mr. Crawford Barlow, on "The Tay Viaduct, Dundee." (3) Mr. W. Inglis, on "The Construction of the Tay Viaduct, Dundee." 8 p.m.

St. Paul's Ecclesiological Society.—Major Heales, F.S.A., on "The Ecclesiology of Bernholm." 7·30 p.m.

Parkes Museum (Lectures for Sanitary Inspectors).—Mr. J. F. J. Sykes, M.B., on "General Powers and Duties of Inspectors of Nuisances. Method of Inspection." 8 p.m.

Halifax Architectural Association.—Inaugural Meeting. (Mechanics' Institute, 8 p.m.)

WEDNESDAY, MAY 9.

Iron and Steel Institute.—Annual Meeting.

Society of Arts.—Mr. S. Chatwood, on "Locks and Safes." 8 p.m.

THURSDAY, MAY 10.

Society of Arts.—Conference on "Canals and Inland Navigation." 2 p.m.

Iron and Steel Institute.—Annual Meeting (continued).

Society of Telegraph-Engineers and Electricians.—Mr. W. H. Preece, F.R.S., on "The Risks of Fire incidental to Electric Lighting." 8 p.m.

FRIDAY, MAY 11.

Parkes Museum (Lectures for Sanitary Inspectors).—Mr. J. F. J. Sykes, M.B., on "Nature of Nuisances, including Nuisances the abatement of which is difficult." 8 p.m.

Royal Institution.—Professor Chandler Roberts-Austen, F.R.S., on "Some curious properties of Metals and Alloys." 9 p.m.

Society of Arts.—Continued Conference on "Canals and Inland Navigation." 2 p.m.

SATURDAY, MAY 12.

Society of Arts.—Continued Conference on "Canals and Inland Navigation." 11 a.m.

Miscellanea.

Artisans' Dwellings in Ireland.—On Saturday a meeting was held in the Mansion House, Dublin, to consider a scheme proposed by Sir Charles Cameron for the improvement of the working classes by providing for them proper dwellings. The Lord Mayor, M.P., who occupied the chair, stated that the capital of Ireland was considerably worse off in the matter of death-rate than the capitals of England and Scotland. He would not say that the unsanitary condition of the houses of the working classes was the sole cause. He had had the advantage of reading a paper by Mr. Spencer, secretary of the Sanitary Association in 1881, showing the effect of improved dwellings on the death-rate of Dublin since 1879, in which year the Artisans' Dwellings Company commenced operations. The death-rate of the city for that year was 37 per 1,000; in 1880 it was the same; but in the half-year ending June, 1881, it fell to 33 per 1,000. Within the last twelve years 3,200 tenements and cottages were provided as follows:—Artisans' Dwellings Company, 1,042; Great Southern and Western Railway Company, 141; Midland Great Western Railway, 105; Industrial Tenement Company, 44; Messrs. Guinness & Co., 516; Messrs. Lombard & McMahon, 1,008; Mr. T. Vance, 196; the Corporation in Barrack-street, 140. The Corporation cleared in the Coombe 4 acres and 36 perches, at a net cost of 19,367*l.*; the Plunket-street area, consisting of 3 acres, 2 roods, 22 perches, cost 27,582*l.* Sir Charles Cameron then said that much had been done by the sanitary authority; 2,000 unsanitary houses had been detenanted and closed within the last seven years. Sir Richard Martin, D.L., moved a resolution to the effect that an association be formed of persons who would undertake to provide, as far as they could, proper dwellings for those in their employment. He was associated with a company who built 1,343 houses, and they received 4½ per cent. on the outlay. Sir George Moyers and Mr. William Findlater, D.L., having addressed the meeting, the proceedings terminated.

Building in Frost.—The question of building in cold weather is naturally one of great importance in Scandinavia, and the Stockholm Building Association recently appointed a committee charged with carrying out some test work. This body has had four series of pillars built of various kinds of brick, stone, mortar, and cement, in cold varying from 8° to 15° C., and as soon as the weather has become fairly warm and dry, another series of pillars are to be built, exactly of the same material, and in the same manner. Tests of various kinds will then be made with the pillars. It is expected that these experiments will go far to solve this problem. It is also proposed to erect a series of similar pillars during the present or next month, when the weather is warm and sunny during the day, but frosty at night, and compare their solidity with that of the former.

Liverpool Engineering Society.—The eighth meeting of the current session was held at the Royal Institution, Colquitt-street, Mr. Charles H. Darbishire, Assoc.M.Inst.C.E., president, in the chair. The discussion of Mr. Webster's paper entitled, "Steam Boiler Explosions," was resumed, and taken part in by members and visitors. Among the latter were Mr. Morris, of the Dallam Forge, Warrington, and Mr. Longridge, of the Manchester Steam Users' Association. The result was a most interesting debate. After Mr. Webster had replied upon the discussion, Mr. C. F. Bamford read a paper entitled, "Air Brakes." This paper was illustrated by numerous diagrams with the aid of an oxy-hydrogen lamp, and dealt exhaustively with the question of continuous brakes for railway trains.

Bath-Rooms.—Now that almost every house of moderate rental has its bath-room, the size and ventilation of these apartments are matters of some importance. There is too great a tendency to think that any odd corner may be used for this purpose, that the first and only necessity is to have the required water-supply laid on, and that for the short time during which the bath is used the quality of atmosphere is quite a secondary matter. It should not need the teaching of a series of fatal accidents to impress an opposite principle. Clearly a room which in course of use becomes rapidly charged with water vapour should exceed rather than come short of the minimum cubic space (say 800 cubic feet) required for each inmate of a normally constructed house. With regard to ventilation, ancient prejudices in favour of closed doors and windows and solid walls have to be combated. These have, however, been pretty generally overcome in the case of sitting-rooms and bedrooms, and should not prove insuperable in the case of the bath-room. There is no necessity for the introduction of cold air from without, for a sufficiently pure atmosphere can usually be obtained from the interior of the house, and an outlet funnel with revolving cowl is all that is required for extraction of the old air and excess of water vapour. Seeing, therefore, that the remedies are apparent, we may hope that in future builders and householders will agree to employ them against the now too evident risks of a warm bath at home.—*Lancet.*

Canara Forest Railway, India.—It is proposed to assist the development of the forest resources of Canara by constructing a narrow-gauge railway, and preliminary surveys have been commenced for a line which will give an easy access to the market for the forest wealth of that part of the Presidency. It will depend, remarks a Bombay contemporary, upon the results of this survey whether the line, if made at all, shall join on to the Southern Maharatta somewhere in the neighbourhood of Dharwar, or whether it shall be carried in the other direction so as to provide for transit by the Kalinadi River to the sea at Karwar. The line, it is proposed, will be of 2 ft. 6 in. gauge, and will be constructed exclusively for forest purposes. The project owes its origin rather to the Forest authorities than to the Public Works Department. Of the forest wealth of that part of the Presidency some idea can be got from the fact that the forest area in the Canara Collectorate exceeds 3,500 square miles, while that of the whole of the other five Collectorates in the Southern Circle put together, — Belgaum, Dharwar, Colaba, Bijapore, and Ratnagiri,—is less than half as much.—*Indian Engineer.*

The Canadian Production of Building Materials in 1887.—Official statistics show the production of building materials in Canada in 1887 to have been as follows:—Cement, 69,843 barrels, of a value of 81,909 dols.; flagstone, 110,925 square feet, value 10,811 dols.; granite, 15,128 tons, value 98,995 dols.; gypsum, 154,000 tons, value 155,277 dols.; lime, 2,303,667 bushels, value 389,369 dols.; marble and serpentine, 242 tons, value 7,845 dols.; sand and gravel (exports), 180,860 tons, value 30,307 dols.; slate, 7,357 tons, value 89,000 dols.; tiles, 8,355,000, value 136,112 dols.; whiting, 500 tons, value 600 dols. Considering the vast mineral resources of Canada, the production is insignificant; but it is a satisfactory sign that it is yearly increasing.

Royal Institution of Great Britain.—The annual meeting of the Royal Institution was held on Tuesday last, Sir Frederick Bramwell, D.C.L., F.R.S., hon.-secretary and vice-president, in the chair. The annual report of the committee of visitors for the year 1887, testifying to the continued prosperity and efficient management of the Institution, was read and adopted. The real and funded property now amounts to above £81,000, entirely derived from the contributions and donations of the members. Forty-one new members were elected in 1887. Sixty-three lectures and nineteen evening discourses were delivered in 1887.

Strikes in the United States.—As in former years, labour troubles played an important part in 1887 in the relations between employers and employés in the United States. According to an estimate in *Bradstreet's*, a reliable authority, the total number of strikes in America last year was 858, the number of strikers being 340,854.

Redcar: Kirkleatham Local Board.—A Local Government Board inquiry was held on the 28th ult. by Mr. Stephen H. Terry, to inquire into the application of the Local Board of that district for permission to borrow 2,750*l.* for private (street) improvements. Mr. James Howcroft, surveyor, produced plans and estimates of the work, which he explained to the inspector, who appeared perfectly satisfied. No one opposed the application. At the close of the inquiry Mr. Terry complimented Mr. Howcroft on the way in which he had carried out the scheme for pumping up salt water for street watering purposes.

Paris a Seaport.—With reference to a recent note on the proposal for making Paris accessible to larger ships, it appears that the scheme has advanced another stage, a detailed plan having just been submitted to the French Chamber by the undertakers, with a petition for a concession. The plan provides for a canal from Rouen to the capital, mostly by the aid of the Seine. It is to be one and a half times as wide as the Suez Canal, and 62 metres in depth, the cost being estimated at about 5,000,000*l.* The contractors ask for no State subsidy, but demand the right of levying a certain rate per ton on all vessels passing through the canal.

Building Operations in New York.—The coming building season will be a very slack one in New York. The statistics of the City Building Department show that the number of buildings proposed this year is only 631, less than half what it was a year ago, and it is necessary to go back to 1884 to find a lower total. A year ago it was proposed to spend $22,000,000 in new buildings; this year the total does not reach $10,000,000. The description of buildings proposed shows that flats and tenements are most in demand, 254 being in that category, while of private dwellings there are ninety-one. Four large buildings will be erected at an aggregate cost of $1,000,000.

St. George's Church, Stalybridge, recently opened by the Bishop, has been rebuilt on the old foundations, which are octagonal on plan, with an addition on west side, comprising entrance, staircase to gallery, &c. The gallery extends as formerly on seven sides, the organ being over the entrance. The exterior is faced with Yorkshire parpoints and Runcorn stone for the windows, and ashlar. The internal woodwork is of pitch-pine, with pulpit and reredos of oak. All the works have been carried out by Messrs. Garside, Barnes, & Co., builders, of Stalybridge, involving an outlay of about 3,300*l.*, under the superintendence of Mr. John Lowe, architect, St. Ann's-square, Manchester.

Remains of an Ancient Roman Bridge.—A bridge, in excellent state of preservation, has just been discovered at the bottom of the river Reno, at the town of Magouza. There are fourteen pillars of great thickness, and Dr. Velkie, director of the museum at Mouza, is of opinion that it was built in the reign of Emperor Domitian, between the years 70 and 100 A.C.

The Parkes Museum.—A meeting will be held at the Parkes Museum, 74a, Margaret-street, W., this Saturday, May 5th, at 3 p.m., at which H.R.H. the Duchess of Albany has consented to distribute the certificates to ladies who have passed the examination following the lectures on Domestic Hygiene by Dr. A. T. Schofield.

Competition: New Church, Westcombe Park, Blackheath.—The designs of Messrs. Newman & Newman, of 31, Tooley-street, London Bridge, have been selected in a limited competition for the new Church of St. George, Westcombe Park, Blackheath. The church complete, with tower and spire, is estimated to cost 7,500*l.*

Wesleyan Schools, St. Just, Penzance. The foundation-stone of the new Wesleyan Sunday schools and class-rooms was laid by Mr. T. B. Bolitho, M.P., on the 6th of April, 1888. The builders are Messrs. W. H. Marks and R. H. Roberts, and the architect is Mr. Oliver Caldwell.

PRICES CURRENT OF MATERIALS.

TIMBER.	£. s. d.	£. s. d.
Greenheart, B.G. ....ton	6 10 0	7 15 0
Teak, E.I. ....load	8 0 0	12 10 0
Sequoia, U.S. ....foot cube	0 2 3	0 3 0
Birch, Canada ....load	2 15 0	4 15 0
Fir, Dantsic, &c.	2 0 0	4 0 0
Oak ,, ...	2 0 0	4 10 0
Canada	4 0 0	6 10 0
Pine, Canada red	2 10 0	3 10 0
,, yellow	2 10 0	4 0 0
TIMBER (*continued*).	£. s. d.	£. s. d.
Lath, Dantsic ....fathom	3 10 0	5 0 0
St. Petersburg	5 0 0	6 0 0
Wainscot, Odessa, crown	2 10 0	3 0 0
Deals, Finland, 2nd and 1st...std.100	8 0 0	9 10 0
,, 4th and 3rd	6 10 0	7 10 0
Riga	6 0 0	7 10 0
St. Petersburg, 1st yellow	9 10 0	14 10 0
,, 2nd ,, ...	8 0 0	9 0 0
,, white	7 0 0	10 0 0
Swedish	7 0 0	15 10 0
White Sea	8 0 0	17 0 0
Canada, Pine, 1st	16 0 0	24 0 0
,, ,, 2nd	10 0 0	15 10 0
,, ,, 3rd, &c.	7 0 0	9 10 0
,, Spruce, 1st	8 0 0	9 10 0
,, ,, 3rd and 2nd	6 0 0	7 10 0
New Brunswick, &c.	6 10 0	7 5 0
Battens, all kinds	4 10 0	11 0 0
Flooring Boards, sq., 1 in., prepared, First	0 10 0	0 12 0
Second	0 7 0	0 9 6
Other qualities	0 4 6	0 6 6
Cedar, Cuba ....foot	0 0 3½	0 0 4
Honduras, &c.	0 0 3½	0 0 3¾
Australian	0 0 2¾	0 0 3¼
Mahogany, Cuba	0 0 4½	0 0 7
St. Domingo, cargo average	0 0 4½	0 0 6
Mexican ,, ...	0 0 4	0 0 4½
Tobasco ,, ...	0 0 4½	0 0 5½
Honduras ,, ...	0 0 4½	0 0 5½
Rose, Rio ....ton	8 0 0	11 0 0
Box, Turkey	5 0 0	12 0 0
Walnut, Italian ....foot	0 0 4	0 0 5½
METALS.		
IRON—Bar, Welsh, in London...ton	4 17 6	5 5 0
,, ,, at works in Wales ...	4 10 0	4 15 0
,, Staffordshire, London	5 10 0	7 0 0
COPPER—		
British, cake and ingot ....ton	81 0 0	0 0 0
Best selected	82 0 0	0 0 0
Sheets, strong	88 0 0	0 0 0
Chili, bars	80 0 0	80 12 6
YELLOW METAL....lb.	0 0 7½	0 0 7⅝
LEAD—		
Pig, Spanish ....ton	13 10 0	0 0 0
English, common brands....	14 0 0	0 0 0
Sheet, English	14 15 0	15 0 0
SPELTER—		
Silesian, special ....ton	18 0 0	18 5 0
Ordinary brands....	17 12 6	17 15 0
TIN—		
Straits ....ton	91 0 0	0 0 0
Australian	91 0 0	0 0 0
ZINC—		
English sheet ....ton	22 0 0	22 10 0
OILS.		
Linseed ....ton	18 10 0	18 12 6
Cocoanut, Cochin	27 0 0	28 0 0
Ceylon	24 0 0	0 0 0
Palm, Lagos	21 0 0	21 10 0
Rapeseed, English pale	24 5 0	24 10 0
,, brown	22 15 0	23 0 0
Cottonseed, refined	21 0 0	21 10 0
Tallow and Oleine	25 0 0	45 0 0
Lubricating, U.S.	5 0 0	6 0 0
,, refined	5 0 0	12 0 0
TURPENTINE—		
American, in casks ....cwt.	1 8 6	0 0 0
TAR—		
Stockholm ....barrel	0 15 0	0 15 6
Archangel	0 9 6	0 10 0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *Noon on Thursdays.*]

BARNET.—For street improvements in the town of Barnet, for the Barnet Local Board. Mr. Mansbridge, surveyor. Quantities supplied:—

	A. £. s. d.	B. £. s. d.	C. £ s. d.	D. £. s. d.
Hirst	1,897 16 0	149 17 6	105 14 0	97 14 8
Voller	1,395 0 0	105 0 0	132 0 0	556 0 0
Houghton	1,233 0 0	48 16 8	140 18 8	211 8 6
Catley	1,126 0 0	106 0 0	70 0 0	188 0 0
Bell	1,072 17 9	59 9 7	88 1 8	193 14 2
Hall	1,009 0 0	58 7 10	96 17 10	193 0 0
Marriott.	998 0 0	48 4 6	153 11 0	262 2 0
Jackson.	900 0 0	77 0 0	135 0 0	209 0 0
*Curnow	922 0 0	70 9 0	96 17 10	239 15 4

* Accepted, including granite kerbing and channelling, £1,089 6s. 10d.
A. Amount of Tender.
B. Add if granite kerb.
C. Add if granite channels.
D. Add if Victoria Paving.

BASINGSTOKE.—For additions to Down Grange, near Basingstoke, for Mr. G. W. Petter. Mr. Geo. W. Webb, A.R.I.B.A., architect, 14, Friar-street, Reading:—

Luscombe & Son, Exeter	£1,180 0 0
Searle, Reading	1,092 0 0
Pike Bros., Basingstoke	944 0 0
Sims, Basingstoke	910 0 0
Bottrill, Reading	798 0 0
Musslewhite, Basingstoke (accepted)	797 10 0

BASINGSTOKE.—For drainage, &c., to Down Grange. Mr. Geo. W. Webb, architect:—

Musslewhite (accepted)	£250 0 0

BRISTOL.—For preparation of site, alterations, and erection of new buildings required in enlarging the Windmill Hill Board Schools, for the Bristol School Board. Messrs. J. W. Trew & Sons, architects, 22, Broad-street, Bristol. Quantities by Mr. Wm. L. Bernard:—

W. Storrs, Sons, & Co., Limited	£3,999 0 0
Stevens, Bastow, & Co.	3,949 0 0
Eastabrook & Sons	3,884 0 0
E. J. Davis	3,876 0 0
G. Humphreys	3,825 0 0
W. Veals	3,800 0 0
E. Gay	3,683 0 0
H. A. Forse	3,650 0 0
J. Bastow	3,590 0 0
W. Cowlin & Son	3,587 0 0
E. Walters	3,573 0 0
H. J. Rossiter	3,370 0 0
A. J. Beaven, Bedminster, Bristol (accepted)	3,300 0 0

BRISTOL.—For St. Saviour's Schools, Redland, Bristol. Mr. John Bevan, architect, 4, Unity-street, College-green, Bristol:—

A. Forse	£1,650 0 0
W. Brock & Son	1,600 0 0
Stephens & Bastow	1,579 0 0
W. Church	1,538 0 0
E. Walters	1,500 0 0
J. Perrott	1,494 0 0
J. Wilkins & Son	1,439 0 0
R. Wilkins & Sons	1,436 0 0
W. Cowlin & Son	1,433 0 0
A. J. Beaven (accepted)	1,400 0 0
E. Love	1,259 0 0

BUCKS.—For additions and alterations at Parmoor, Bucks., for Mr. C. A. Cripps. Mr. Arthur Vernon, architect, High Wycombe:—

C. H. Hunt	£940 0 0
W. R. Loosby	935 15 0
Y. J. Lovell	930 0 0

CHELSEA.—For erecting covered playground for boys, at the Park-walk School (Chelsea O), for the School Board for London. Mr. T. J. Bailey, architect.:—

W. Lowes	£112 10 0
C. Wall	87 0 0
J. Holloway	79 0 0
Stimpson & Co.	74 0 0
W. Johnson*	71 0 0

* Recommended by the Works Committee for acceptance.

CHESHAM (Bucks.).—For construction of new roads at Chesham, Bucks. Mr. Arthur Vernon, architect, High Wycombe:—

G. Darlington	£465 10 0
T. Free & Sons	305 10 0
H. Hill	280 0 0
Currall & Lewis	270 0 0

CLAPTON.—For alterations, &c., to the London Tavern, Kenninghall-road, Clapton. Mr. W. Ansell, architect:—

S. Godden	£1,109 0 0
T. Boyce	1,095 0 0
W. Shurmur	1,044 0 0
W. Scrivener	980 0 0
J. Anley	920 0 0
S. Goodall	918 0 0
Godfrey & Son	845 0 0

COLCHESTER.—For repairs, &c., Colne-place, for Mr. F. B. Philbrick. Mr. Herbert Goodyear, architect:—

	Builder's Work.	Decorator's Work.
Everett & Son	£327 0 0	£149 0 0
Orfeur	289 0 0	209 0 0
Rogers	—	195 18 6
Dupont	273 0 0	151 0 0
Diss	270 0 0	150 0 0
Beard	253 0 0*	147 0 0
Mills & Son	—	138 16 0*

* Accepted.

DALSTON.—For erection of a house at Stonebridge-road, Dalston. Mr. E. Brown, architect:—

Taylor	£389 0 0
W. Shurmur	369 0 0
S. W. Hawkings	329 0 0
Steel Bros.	280 0 0

EALING.—For the erection of two houses in the Endsleigh-road, for Mr. James Wright. Mr. Charles Coppen, architect and surveyor, Ealing, W.:—

Jesse Spackman (accepted)	£356 0 0

[No competition].

ENFIELD.—For house, for Mr. Wood. Messrs. Searle, Halton, & Bowyer, architects, Tottenham:—

Amended Tenders.

Ashby	£357 0 0
Coote	340 0 0
Harrison & Crabb (accepted)	339 0 0

FINSBURY.—For the extension of warming apparatus at the Blundell-street School (Finsbury AU), for the School Board for London. Mr. T. J. Bailey, architect:—

Korting Bros.	£269 7 8
J. Grundy	245 0 0
C. Bolton	245 0 0
W. Summerscales & Sons	238 0 0
W. G. Cannon	236 10 0
C. P. Kinnell & Co.	235 0 0
J. & F. May	230 0 0
Comyn Ching & Co.	209 0 0
H. C. Price Lea & Co.	207 0 0
R. Crane	205 0 0
R. H. & J. Pearson	178 15 6
T. Green & Son	175 5 0
Young & Buss	165 0 0
J. Jeffreys	160 0 0
J. G. Stidder, Davis, & Co.*	140 0 0

* Recommended by the Works Committee for acceptance.

GREENWICH.—For the enlargement of the Randall-place School (Greenwich C), by 120 places, for the School Board for London. Mr. T. J. Bailey, architect:—

J. Derry	£1,477 0 0
J. Holloway	1,420 0 0
Stimpson & Co.	1,400 0 0
Kirk & Randall	1,366 0 0
H. L. Holloway	1,243 0 0
W. H. Lorden & Son*	919 0 0

* Recommended by the Works Committee for acceptance.

HAMMERSMITH.—For mortuary and post-mortem room, for the Hammersmith Vestry. Mr. Mair, Surveyor to the Vestry. Quantities by Mr. Alfred J. Bean:—

Mears	£342 0 0
Leslie & Knight	330 0 0
Earsdon	295 0 0
King & Co.	259 0 0
Coat	252 0 0
Bendon	239 0 0
Webb & Rosser, Hammersmith*	229 0 0

* Accepted.

HORNSEY.—For painting and decorating, &c., to be done for the Hornsey Local Board. Mr. T. de Courcy Meade, surveyor:—

Tilbrook	£103 12 9
Marks	89 17 0
Kessels	86 0 0
Dixon	78 0 0
Hobbs & Son	68 7 0
Foxley	60 10 6
Marchant, Lady Somerset-road*	57 5 0

* Accepted.

COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

COMPETITIONS.

Nature of Work.	By whom required.	Premium.	Designs to be delivered.	Page.
Schools, Boarding House, &c., Coventry	Trustees, Bablake B. C.	50*l.* and 25*l.*	May 29th	ii.
Laying-out Estate, &c., near Liverpool	W. P. Hartley	50 gs., 30 gs., & 20 gs.	June 5th	xi.
Restoration of St. Lawrence Church, Jersey	The Committee	30*l.*	June 30th	xi.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Repairing and Re-gravelling Roads	St. Giles's, Camberwell, Burial Board	*Official*	May 7th	xi.
Making-up and Paving Roads	Wandsworth Bd. of Wks	do.	May 8th	ii.
Kentish Rag Tar Paving	Southend Local Board	P. Dodd	do.	ii.
Pipe-Laying, Approach-road, & Gauge House	Northwich Local Board	H. Bancroft	May 9th	xi.
Road-Making and Paving Works	Hammersmith Vestry	*Official*	do.	xi.
Pump-House, Water-Mains, &c.	Hertford Corporation	W. H. Wilds	May 10th	xi.
Granite Curb, Fencing, &c.	Barking Town Local Bd.	C. J. Dawson	do.	xi.
Stoneware Pipe-Sewers, &c.	do.	do.	do.	xi.
Engine, Pumps, &c., for Waterworks	Uxbridge Local Board	G. Ives	May 11th	ii.
Deepening Well, &c.	do.	do.	do.	ii.
Painting North-Western Hospital	Met. Board of Works	*Official*	May 14th	xii.
Construction of Aqueduct	Manchester Watrwks C.	G. H. Hill	May 15th	ii.
Repairing Lodges, &c., Hammersmith	Met. Board of Works	*Official*	do.	xi.
Tar-Paving Works, Finsbury Park	do.	do.	do.	xi.
Repairing Lodges, Battersea Park	do.	do.	do.	xi.
Rebuilding Union House	Chelmsford Union	F. Chancellor	do.	xi.
Infectious Hospital, Devises	County of Wilts	C. S. Adye	do.	xi.
Alterations to Farm Buildings, near Watford	Met. Asylums Board	J. Walker	do.	xii.
Cleansing, &c., Works	Chelsea Guardians	A. & C. Harston	May 16th	xi.
Asphalte Paving	St. Margaret & St. John (Westminster) Ves.	G. R. W. Wheeler	do.	xii.
Boat-house, &c., St. Leonard's	Admiralty	*Official*	May 18th	xi.
Slaughter-House, St. Helier	Jersey Piers, &c., Com.	do.	do.	xi.
Parcel Post Office, Liverpool	Com. of H.M. Works	do.	do.	ii.
Assembly Rooms, Surbiton	The Directors	A. Mason	May 19th	xii.
Mess Rooms and Cottages	Fareham County Asylum	J. Robinson	May 21st	xii.
Roads and Sewers	Streatham and General Estates Co., Lim.	Street & Scholefield	do.	xii.
Public Baths	Gloucester Cor.	J. Fletcher Trew	May 24th	xii.
Broken Granite and Granite Setts	Croydon Cor.	W. Powell	May 29th	xi.
Additions to Slaughter-Houses, Fencing, &c.	do.	T. Walker	do.	xii.
Works at Fowey	Great Western Ry. Co.	*Official*	do.	xii.
Works at Paignton	do.	do.	do.	xii.
First Portion, Imperial Institute	Organising Committee	T. E. Colcutt	do.	xii.
Erection of Arcade, Leeds	.....	E. Clark	Not stated	xii.
Two Schools	Tottenham School Brd.	C. Bell	do.	xii.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page
Clerk of Works	Hammersmith Vestry	2*l.* 2s. weekly	May 12th	xvi.

KENSINGTON.—For new lying-in wards, to be erected at the workhouse, Marloes-road, Kensington, for the Guardians of the Poor of St. Mary Abbott's, Kensington. Mr. H. H. Bridgman, F.R.I.B.A., architect. Quantities supplied by Mr. F. Thomson:—

Mears	£3,750 0 0
Mowlem & Co.	3,600 0 0
Richardson Bros.	3,595 0 0
Shillitoe & Son	3,595 0 0
J. Morter	3,590 0 0
Higgs & Hill	3,575 0 0
Brass & Sons	3,475 0 0
Wall Bros.	3,468 0 0
G. Lyford	3,440 0 0
J. Longley	3,395 0 0
Staines & Co.	3,394 0 0
Perry & Co.	3,391 0 0
F. R. Turtle	3,380 0 0
Patman & Fotheringham	3,333 0 0
W. Nash	3,300 0 0
Lawrance & Sons	3,296 0 0
Haines	3,290 0 0
Ashford & Co.	3,260 0 0
Kirk & Randall	3,247 0 0
C. Wall	3,229 0 0
J. Robson	3,198 0 0
Scrivener & Co.	3,145 0 0
R. Toms	3,119 0 0
S. R. Lamble	3,067 0 0
W. M. Dabbs, Stamford-hill	2,998 0 0

KINGSLAND.—For alterations, &c., at the Bull Inn, High-street, Kingsland. Messrs. Bird & Walters, architect:—

F. Mark	£730 0 0
Patman & Fotheringham	695 0 0
W. Shurmur	693 0 0
H. Burman & Son	690 0 0
S. Goodall	679 0 0
Jackson & Todd	590 0 0
G. Mower	566 0 0

LAMBETH.—For providing new room for managers' and infants' teachers, at the Gipsy-road School (West Lambeth AX), for the School Board for London. Mr. T. J. Bailey, architect:—

S. Smith	£186 5 0
J. W. Roy	173 8 0
Caplen & Redgrave	169 0 0
W. H. Lorden & Son	149 0 0
J. Smith & Sons	145 0 0
J. Holloway	127 0 0
T. Henderson *	115 13 0

* Recommended by the Works Committee for acceptance.

LAMBETH.—For erecting covered playgrounds for boys, and for girls and infants, at the Jessop-road School (West Lambeth X), for the School Board for London. Mr. T. J. Bailey, architect:—

T. Cruwys	£459 0 0
Crabb & Son	355 0 0
R. Mayo	309 0 0
T. Bendon *	300 0 0

* Recommended by the Works Committee for acceptance.

LAMBETH.—For providing new teachers' room, cloakroom, and infants' w.c.'s, &c., at the South Lambeth-road School (West Lambeth N), for the School Board for London. Mr. T. J. Bailey, architect:—

T. Linfield	£272 0 0
T. Henderson	264 0 0
J. Holloway	216 0 0
J. W. Roy	209 0 0
J. Bullers	189 0 0
W. F. Russell *	157 0 0

* Recommended by the Works Committee for acceptance.

LONDON.—For improvements at the Lord Wellington Tavern, Old Kent-road. Mr. R. A. Lewcock, architect, 88, Bishopsgate-street Within, E.C.:—

Dawes	£525 8 8
Goodall	399 0 0
Steel Bros.	394 0 0
Walker	390 0 0
Wythe	376 0 0
Spencer & Co.	375 0 0

LONDON.—For rebuilding Nos. 386 and 388, Bethnal Green-road, E. Thos. & Wm. Stone, architects, 2, Great Winchester-street, E.C.:—

Hood	£1,277 0 0
Knight	1,257 0 0
Higgs	1,104 0 0
Beale	1,092 0 0
Winkley	1,090 0 0
J. Jarvis & Sons (accepted)	1,080 0 0

LONDON.—For providing glazed partition on the second floor to enclose pupil teachers' room; erecting male teachers' w.c.'s and urinals; and female teachers' w.c.'s, at the Essex-street School (Tower Hamlets I), for the School Board for London. Mr. T. J. Bailey, architect:—

J. Webb	£175 0 0
H. L. Holloway	164 0 0
Hale & Twitchen	150 0 0
J. W. Roy *	144 18 0

* Recommended by the Works Committee for acceptance.

LONDON.—For enclosing, levelling, and tar-paving the additional playground for girls, at the Wright's-road School (Tower Hamlets Q1), for the School Board for London. Mr. T. J. Bailey, architect:—

J. W. Roy	£288 0 0
Norris & Luke	173 0 0
Hale & Twitchen	170 0 0
J. Webb *	157 10 0

* Recommended by the Works Committee for acceptance.

LONDON.—For enclosing, levelling, and tar-paving the additional playground for the boys at the Old Castle-street School, Whitechapel (Tower Hamlets A), for the School Board for London. Mr. T. J. Bailey, architect:—

W. S. Witcher	£159 0 0
J. W. Roy	154 18 0
T. Torode	150 0 0
Stevens Bros.	148 10 0
Hale & Twitchen *	145 0 0
Norris & Luke (withdrawn)	129 0 0

* Recommended by the Works Committee for acceptance.

LONDON.—For putting in new shop front and fittings, and general repairs to house, No. 143, Mile End-road, London, E. Mr. H. Riches, architect, 59 and 60, Cornhill, London, E.C.:—

Coulsell Bros.,* Bethnal-green	£176 10 0

* Accepted.

MAPLEDURHAM.—For alterations to the Pack Saddle, Mapledurham, near Reading, for Messrs. Blandy & Hawkins. Mr. Geo. W. Webb, A.R.I.B.A., architect, 14, Friar-street, Reading:—

Strong Bros., Reading	£219 0 0
Butler, Mapledurham	157 15 0
Hall, Mapledurham	146 0 0
Winkworth, Reading	138 0 0

RAYLEIGH (Essex).—For the erection of a cottage on a piece of land situate on the Whitehouse Farm Estate. William A. Burr, architect, 65, Chancery-lane, W.C.:—

Baldwin, Rayleigh	£432 0 0
G. Allen, Southend	370 10 0
Baker & Hainsworth, Rayleigh	357 0 0
Bullock & Woodiwiss, Southend	270 0 0
Ditto (amended Tender)*	206 5 0

* Accepted.

READING.—For a public-house, Prince of Wales-avenue, Elm Lodge Estate, Reading. Mr. Geo. W. Webb, architect:—

Estates Workmen	£600 0 0

READING.—For stabling for ten horses, the Sun Inn, Reading, for Messrs. Blandy & Hawkins. Mr. Geo. W. Webb, architect:—

Estates Workmen	£200 0 0

READING.—For five new roads on the Elm Lodge Estate, Reading. Mr. Geo. W. Webb, A.R.I.B.A., architect, 14, Friar-street, Reading:—

Winkworth	£4,920 0 0
Pilgrim	1,095 0 0
Currall, Lewis, & Co. High Wycombe	806 0 0
Winter & Fitt, Reading	743 0 0
Free Bros., Wycombe	740 9 9
Iles, Wimbledon	696 15 11
Hill, Wycombe	691 10 0
Ruffles Bros., Reading	619 0 0
Talbot, Reading	504 4 0
Collier & Catley, Reading	468 1 0
Trueman, Hackney	460 0 0
Reeves, Reading (accepted)	409 0 0

READING.—For sewage and surface-water drains to the above roads, on the Elm Lodge Estate. Mr. Geo. W. Webb, architect, Reading:—

Winkworth, Reading	£1,852 0 0
Hill, Wycombe	917 0 0
Free Bros., Wycombe	886 9 6
Bottrill, Reading	880 10 0
Iles, Wimbledon	826 14 6½
Currall & Lewis, Wycombe	810 10 0
Winter & Fitt, Reading	786 0 0
Pilgrim, Reading	781 10 0
Ruffles Bros., Reading	752 10 0
Talbot, Reading	752 6 4
Trueman, Hackney	730 0 0
Collier & Catley, Reading	601 18 0
Reeves (accepted)	571 0 0

REDRUTH.—For the enlarging, reseating, renovation, and other alterations to the Wesleyan Chapel, Illoganhighway, Redruth. Mr. Oliver Caldwell, architect, Victoria-square, Penzance:—

R. Walters, Penzance	£629 10 0
James Julian, Truro	614 0 0
J. Berryman, Camborne	604 10 0
W. Richards, Camborne	594 0 0
Olver & Sons, Falmouth	589 0 0
T. Willoughby, Redruth	575 0 0
W. H. Moyle & Gray,* Chacewater	535 0 0
Thos. Kistle, Redruth	545 0 0

* Accepted.

ST. ALBANS.—For alterations and additions to the Court-house, St. Albans, for the Magistrates of the County of Hertford. Mr. Urban A. Smith, C.E., County Surveyor:—

Shillittoe & Son, Bury St. Edmunds	£716 0 0
J. W. Savage, St. Albans	671 0 0
Ward, Clark, & Co., Old Kent-road	639 0 0
Ellwood & Son, Sandy, Beds.	570 0 0
Waterman & Son, Watford	557 0 0
F. Dupont, Colchester	545 0 0
Chris. Miskin, St. Albans	530 0 0
Thos. Turner,* Limited, Watford	486 0 0
John Curnow, High Barnet	449 0 0

* Accepted.

ST. LEONARDS-ON-SEA.—For alteration and additions to the Alexandra Hotel, St. Leonards-on-Sea. Messrs. Elworthy & Son, architects:—

Lester, Hastings	£5,897 0 0
Taylor Bros., Hastings	5,108 0 0
Harman, Hastings	5,100 0 0
Salter, St. Leonards	4,995 0 0
F. J. Cruttenden, St. Leonards	4,985 0 0
Jenkins, St. Leonard's	4,971 0 0
Eldridge & Cruttenden, St. Leonard's	4,741 0 0
H. H. White, St. Leonards	4,693 0 0
Hughes, St. Leonards	4,650 0 0
H. Cruttenden,* St. Leonards	4,036 0 0

* Accepted.

STRATFORD.—For building the West Ham Hospital at Stratford. Messrs. J. L. & A. C. Houston, architects, 28, Essex-street, W.C. Quantities by Messrs. R. L. Curtis & Sons, 119, London-wall, E.C.:—

Atherton & Latta, Poplar	£5,270 0 0
Boyce, Hackney	5,100 0 0
Shurmur, Clapton	4,995 0 0
Egan, Buckhurst-hill	4,975 0 0
Hosking, Forest-gate	4,967 0 0
Gregar, Stratford	4,930 0 0
Morter, Stratford	4,849 0 0
Nightingale	4,848 0 0
North Bros., Stratford	4,775 0 0
Patman & Fotheringham	4,673 0 0
Gentry, Stratford	4,670 0 0
Cox, Hackney	4,660 0 0
Smith & Sons, South Norwood	4,647 0 0
Reed, Stratford (accepted)	4,494 0 0

ST. PANCRAS.—For pulling down old buildings, and the erection of nine blocks of new buildings, &c. (allowing for old materials), on the workhouse site in King's-road, Pancras-road, N.W., for the Guardians of the Poor of the Parish of St. Pancras. Mr. H. H. Bridgman, F.R.I.B.A., architect. Quantities supplied by Messrs. Corderoy, Selby, & Farthing :—

W. Shurmur	£82,971	0	0
Higgs & Hill	77,500	0	0
Holland & Hannen	76,920	0	0
H. Wilcock	75,490	0	0
Parnell & Sons	75,037	0	0
Patman & Fotheringham	74,860	0	0
Howell & Sons	74,750	0	0
Colls & Sons	74,600	0	0
Bell & Sons	73,980	0	0
Perry & Co.	72,769	0	0
E. Toms	72,100	0	0
Shepherd	72,100	0	0
Grover & Son	71,857	0	0
J. Morter	71,650	0	0
E. B. Nightingale	71,300	0	0
J. Mowlem & Co.	71,032	0	0
Brass & Sons	70,939	0	0
C. Killingback	70,782	0	0
W. Scrivener	70,290	0	0
A. Krauss	69,949	0	0
S. R. Lamble	69,651	0	0
J. Fell	69,005	0	0
Lawrance & Sons	69,000	0	0
Wall Bros.	68,195	0	0
Mark Gentry	68,000	0	0
S. & W. Pattinson	67,725	0	0
Rudd & Son	66,434	0	0
Kirk & Randall	66,321	0	0
Kirk, Knight, & Co., Sleaford (late)	65,800	0	0

STOKE NEWINGTON.—For erection of new dwellings at Stoke Newington, for the Trustees of the West Hackney Almshouses. Mr. H. Cheston, architect :—

S. Goodall	£2,061	0	0
F. & J. Hicks	1,988	0	0
Coldwell & Son	1,935	0	0
S. Hayworth	1,933	0	0
W. Shurmur	1,899	0	0
Kilby & Gayford	1,846	0	0
Paine Bros.	1,819	0	0
W. Dabbs	1,749	0	0

SURBITON.—For pair of villa residences, Worthington-road, Surbiton, for Mr. G. E. Elvin. Mr. J. E. Sears, architect and surveyor, 16, New Bridge-street, E.C. :—

Hollingsworth, East Dulwich	£862	0	0
Higgs, Loughborough Junction	838	0	0
Marsland, Walworth	805	0	0
Oldridge & Sons, Norbiton	783	0	0
Atkins Bros., Surbiton	672	0	0
G. Constable & Son, Hampton-wick	630	0	0

TWYFORD (Berks.).—For additions to residence of Captain Coleridge. Mr. E. G. Bruton, F.S.A., architect, Oxford. Quantities by architect :—

Symm & Co., Oxford	£1,577	0	0
Lovell, Great Marlow	1,540	0	0
Wilkins & Sons, Oxford	1,480	0	0
Chas. Curtis, Oxford	1,469	0	0
Silver & Sons, Maidenhead (accepted)	1,383	0	0

WEST BROMWICH.—For the erection of a house for Mr. David Mould. Mr. J. R. Nichols, architect, 59, Colmore-row, Birmingham :—

George Arnold, West Bromwich	£720	0	0
J. Harley & Son, Smethwick	670	0	0
John Webb, Lozells, Birmingham	650	0	0
C. A. Horton, Brierley-hill	640	0	0
William Fisher, West Bromwich	637	0	0
A. Wilkes, West Bromwich	631	0	0
Walton Bros., Smethwick	582	0	0
John Dallow, Blackheath	545	0	0
H. Dorse & Son, Cradley-heath	525	0	0
Richard Heelis,* West Bromwich	510	0	0

* Accepted.

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Now ready.
READING CASES, { NINEPENCE EACH. By post (carefully packed), 1s.

London temp. Henry VIII. (With Key).

Price Eightpence; by post, 10d.

New Reredos, St. Paul's Cathedral.

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The above Plates (reprinted from the *Builder*), on stout paper, unfolded and suitable for framing, are now ready, and will be sent, carefully packed on receipt of stamps; or they may be ordered through any Newsvendor.

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FIRE BRICKS.

STOURBRIDGE BEST FIRE BRICKS, 80s. *M.*
Ditto FIRE CLAY, 25s. a ton.
Also in Stock: Fire Lumps, Fire Tiles, Boiler Seatings, and Flue Covers.
R. CULL & SON, Manufacturers,
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Best quality—White
Headers at 9*l.* 5s. *M.*
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3d. 4d. 7d. 11d. per ft.
Subject to a large discount for railway truck loads.
Bends, Junctions, Syphons, Gullies, &c. Kitchen Sinks, Closet Pans, &c. in Stock.
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City Office : — 72, Palmerston-buildings, Old Broad-street, E.C.

TO CORRESPONDENTS.

Registered Telegraphic Address, "THE BUILDER, LONDON."

"Paper Weights" (we have long promulgated a "standing order (see below) that we cannot undertake to point out books).—W. R.—C. & C.—H. W. W. (will reply when we know more of the competition referred to).—R. A. L. (should send amounts in all cases).—G. S. (ineligible, because amount not sent).—W. S. (last list sent too small).—H. E. R. (should send amounts).—E. J. H. (too late).—B. & F. (too late).—E. P. L. B. (too late).—W. S. S. (too late).

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication

We are compelled to decline pointing out books and giving addresses.

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BOX GROUND. | COMBE DOWN.
WESTWOOD GROUND. | STOKE GROUND.

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THE CHELYNCH STONE. The stone from these quarries is known as the "Weather Beds," and is of a very crystalline nature, and undoubtedly one of the most durable stones in England.

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Greater facilities have been provided for working these quarries, and the stone can be supplied in large quantities at short notice.

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Seyssel, Patent Metallic Lava, and White Asphaltes.
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IMPORTANT COMMUNICATION.—FIRE AT WHITELEY'S.

WILLIAM WHITELEY, Westbourne Grove,
London, Oct. 12th, 1887.

HOBBS, HART, & CO., LIMITED.

GENTLEMEN.—It affords me very much pleasure to express to you my satisfaction and admiration at the splendid fire-resisting powers of your Strong-room doors and the Safes.

The recent fire at my establishment in my opinion subjected them to the greatest possible test, and through all, they proved invulnerable.

The contents of both Strong Rooms and Safes were entirely preserved, although the fire was of such intense destructive force.

You will be pleased to hear that it has been decided to adopt your Patent Clutch-rebated Doors for all the party-walls in the new building now in course of erection.—I am, Gentlemen, faithfully yours,

(*Signed*) WILLIAM WHITELEY.

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